Vol. 936 Number 4

# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

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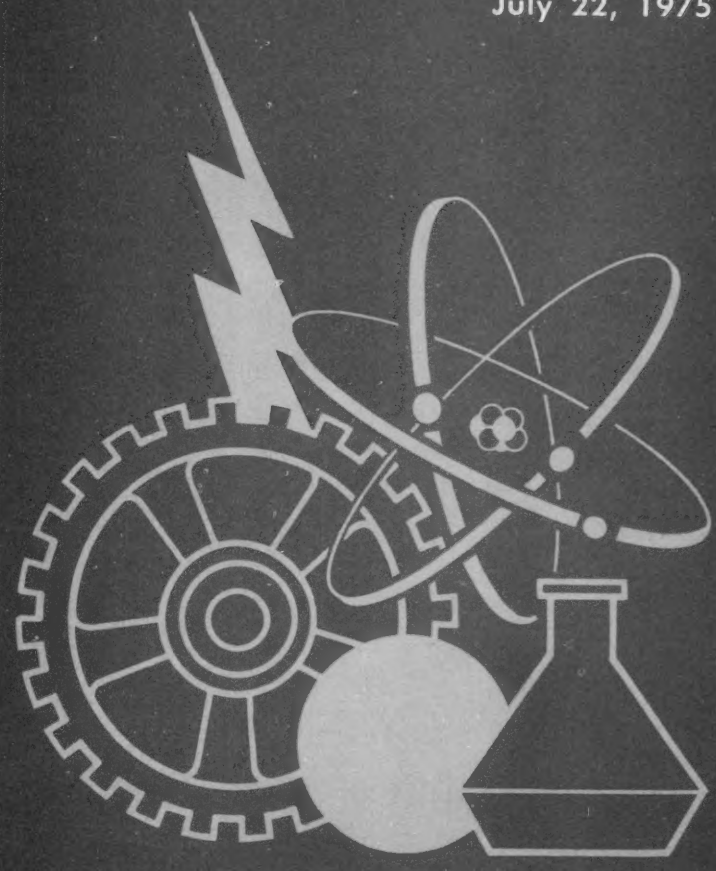

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# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 22, 1975 Volume 936 Number 4


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# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Suits

Notices under 35 U.S.C. 290; Patent of 1952

**2,828,449,** I. L. Kerper, SAFETY FEATURE FOR ELECTRIC WATERTIGHT DOOR SYSTEMS, **filed** Mar. 4, 1971, D.C., S.D.N.Y., Doc. 71–957, *Irving L. Kerper* v. *Grace Line et al.* Order that action is statistically closed, Sept. 11, 1974.

**2,877,501,** R. Bradt, GLASS-REINFORCED THERMOPLASTIC INJECTION MOLDING COMPOUND AND INJECTION-MOLDING PROCESS EMPLOYING IT, **filed** Jan. 14, 1970, D.C., E.D. Mich. (Detroit), Doc. 34249, *Dart Industries, Inc.* v. *Thermofil, Inc.* Stipulation re dismissal of action, dismissing complaint and the counterclaim with prejudice, Aug. 9, 1974.

**2,893,992,** L. H. Sternbach, 1,4 - BENZODIAZEPINE 4-OXIDES, **filed** Jan. 20, 1975, D.C.N.J. (Newark), Doc. 75–96, *Hoffmann LaRoche, Inc.* v. *Zenith Laboratories, Inc. and Paramount Surgical Supply Corp.*

**2,968,363,** W. A. Kinkaid, DISPENSING MERCHANDISE BY INDIVIDUAL SELF SERVICE; **3,298,461, same,** PROCESS FOR DISPENSING MERCHANDISE AND FOODS; **3,391,758,** Kinkaid and Kobman, DISPENSING MERCHANDISE BY INDIVIDUAL SELF-SERVICE, **filed** Mar. 3, 1975, D.C., S.D. Ohio (Cincinnati), Doc. C–1–75–70, *B/W Metals Co., Inc.* v. *The Kayway Co.*

**3,003,735,** L. N. Havener, SUSPENSION CLIP; **3,599,921,** W. J. Cumber, INDEPENDENT SUPPORT CLIPS, **filed** Aug. 30, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2504, *Erico Products, Inc.* v. *Minerallac Electric Company.*

**3,011,234,** T. E. Fiddler, SPRING BIASED ATTACHING CLIP; **3,279,013, same,** FASTENER FOR MOLDINGS; **3,637,-961,** Fiddler and Adams, CONTROL DEVICE FOR ACTUATING A SWITCH AND DIRECTING A FLUID PRESSURE FORCE, **filed** Mar. 6, 1975, D.C. Minn. (St. Paul), Doc. C–1–75–76, *Lake Center Industries* v. *Theodore E. Fiddler and T. E. Fiddler Associates, Inc.*

**3,038,964,** A. G. Bose, LOUDSPEAKER SYSTEM; **3,582,553, same, filed** Feb. 26, 1975, D.C. Minn. (Minneapolis), Doc. 4–75–C 89, *Bose Corporation* v. *John Watkins, Jr., doing business as Speakers, Inc. and Watkins Engineering Co.*

**3,090,605,** Copeland and Neier, FEED MIXER, **filed** Mar. 15, 1972, D.C. Kans. (Wichita), Doc W–4812, *Hydraulics Unlimited Mfg. Co.* v. *B/J Manufacturing Co., Inc., and James V. Copeland and Benjamin R. Neier.* Order plaintiff's cause of action against the defendants and defendants' cause of action against plaintiff shall be and are dismissed with prejudice, Nov. 19, 1974. **Same, filed** Mar. 24, 1972, D.C. Kans. (Wichita), Doc. W–4816, *B/J Manufacturing Co., Inc.* v. *Hydraulics Unlimited Mfg. Co.* Order plaintiff's cause of action against the defendants and defendants' cause of action against plaintiff shall be and are hereby dismissed with prejudice, Nov. 19, 1974.

**3,116,557,** J. R. Trice, Jr. METHOD AND MEANS FOR LAYING SEWER PIPE, **filed** Jan. 28, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c243, *Laser Alignment, Inc.* v. *Spectra-Physics, Inc.*

**3,174,688,** V. H. Chatten, ORNAMENTAL DEVICE USING LIQUID DROPLETS, **filed** Sept. 27, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2796, *Creators, Inc.* v. *Montgomery Ward & Co., Incorporated and The Wickes Corporation.*

**3,201,038,** J. P. Harris, DATA REGISTERING DEVICE, **filed** Dec. 26, 1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–2723 AJZ, *Computer Electron Systems, Inc.* v. *Electronic Marketing Inc. and Fidlar & Chambers.*

**3,214,506,** G. T. Corbin, Jr., METHOD FOR MAKING HOLLOW PLASTIC ROTATIONAL CASTING AND FOR REMOVING CASTING FROM MOLD; **3,312,575, same,** METHOD OF MAKING METALLIC-LINED PRESSURE VESSEL; **3,357,875, Same,** MULTI-PART HOLLOW CASTING, **filed** Feb. 21, 1975, D.C. Pa. (Philadelphia), Doc. 75–511, *Anthony Skowyrski et al.* v. *Remcor, Inc. et al.*

**3,222,073,** B. Degaetano, PHONOGRAPH FOR TOYS, **filed** Aug. 4, 1970, D.C., S.D.N.Y., Doc. 70–3335, *Ben Degaetano* v. *Leisure Group Inc. et al.* Filed stipulation and order that this action is dismissed with prejudice, July 23, 1973.

**3,249,270,** B. Zuckerman, GARMENT SUPPORT MEANS, **filed** Sept. 7, 1967, D.C., S.D.N.Y., Doc. 67–C–3428, *Mr. Hanger, Inc.* v. *Warbern Plastics, Inc.* Filed final consent judgment, ordered that defendant is perpetually restrained and enjoined from infringing patent, etc., Feb. 3, 1970.

**3,254,510,** B. G. Lesley, WARP KNIT PILE FABRICS; **3,277,673, same,** METHOD FOR PREPARING KNIT FABRICS; **3,522,154,** D. A. Swalheim, CODEPOSITED IRON AND TIN ELECTROPLATE AND A PROCESS AND ELECTROPLATING BATH FOR ITS PREPARATION, **filed** Mar. 26, 1975, D.C., S.D.N.Y. Doc. 75–C–1500, *H. Warshow & Sons, Inc.* v. *Deering Milliken Inc.*

**3,277,673.** (See 3,254,510.)

**3,279,013.** (See 3,011,234.)

**3,298,461.** (See 2,968,363.)

**3,312,575.** (See 3,214,506.)

**3,357,875.** (See 3,214,506.)

**3,363,271,** C. Schneider, FURNITURE BASE CONSTRUCTION, **filed** Mar. 17, 1975, D.C. Kans. (Topeka), Doc. 75–49–C5, *Charles Schneider & Co., Inc.* v. *Carl L. Lewis, R. Glenn Stoffer and Hubbels, Inc.*

**3,391,758.** (See 2,968,363.)

**3,400,227,** Lear and Auld, COMBINED RADIO AND MAGNETIC TAPE PLAYER; **3,403,868,** W. P. Lear, MAGNETIC TAPE CARTRIDGE SYSTEM; **3,347,762,** Lear and Auld, MULTI-TRACK TAPE CARTRIDGE PLAYER; **3,560,126,** W. P. Lear, MAGNETIC TAPE CARTRIDGE PLAYER SYSTEM, **filed** Apr. 26, 1972, D.C. Del. (Wilmington), Doc. 4370, *Motorola, Inc.* v. *Gates Lear Jet Corporation,* Order transferring this case pursuant to 28 U.S.C. Section 1404(a) to the United States District Court for the District of Colorado, Nov. 24, 1972.

**3,403,868.** (See 3,400,227.)

**3,437,762.** (See 3,400,227.)

**3,506,828,** Hansen and Bush, QUATERNARY AMMONIUM BASES AND LIQUID SCINTILLATION COUNTING SOLVENT, **filed** Dec. 31, 1974, D.C., N D. Ill. (Chicago), Doc. 74c3787, *C. D. Searle & Co.* v. *Packard Instrument Co., Inc.* Motion to dismiss under Rule 41 F.R.C.P. pursuant to stipulation of dismissal, Mar. 24, 1975.

**3,522,154.** (See 3,254,510.)

**3,582,553.** (See 3,038,964.)

**3,587,177,** Overly and Pagel, AIRFOIL NOZZLE; **3,629,952, same,** AIRFOIL WEB DRYER, **filed** Mar. 25, 1975, D.C., E.D. Wisc. (Milwaukee), Doc. 75–162, *Overly, Inc.* v. *Tec Systems, Inc.*

**3,599,921.** (See 3,003,735.)

**3,629,952.** (See 3,587,177.)

**3,637,961.** (See 3,011,234.)

**3,716,871,** A. G. Borse, DISPOSABLE URINAL, **filed** July 9, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1763, *Borse Plastic Products Corporation* v. *Premium Plastics, Inc.* Parties motion on stipulation to dismiss action without prejudice granted, Oct. 29, 1973.

**3,732,419,** Kulberg and Muehllehner, SCINTILLATION CAMERA WITH IMPROVED RESOLUTION **filed** Nov. 18, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3327, *Searle Analytic, Inc.* v. *Ohio Nuclear, Inc.;* **filed** Mar. 19, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–250, *Searle Analytic, Inc.* v. *Ohio Nuclear, Inc.*

**3,749,974,** W. R. Kissel, ELECTRONIC IGNITION CON-*Motorola, Inc.* v. *Gates Lear Jet Corporation.* Order transfer-Doc. 75–64–C6, *Chrysler Corporation* v. *Automotive Controls Corp. and The Echlin Manufacturing Co., Inc.*

**3,759,305,** D. E. McIntyre, CREDIT CARD CARRYING CASE, **filed** Mar. 14, 1975, D.C. Ariz. (Phoenix), Doc. C–75–150–PHX WEC, *AMBA Marketing Systems, Inc.* v. *Jobar International Inc.*

**3,791,346,** Willinger and Dinnerstein, RODENT HABITAT, *filed* Apr. 1, 1975, D.C.N.D. Ill. (Chicago), Doc. 75c1036, *Metaframe Corporation* v. *Pets International Ltd., Inc. and Genyk Products Limited.*

**3,833,059,** P. L. Sisson, HOT GAS APPARATUS FOR RECOVERY OF OIL VALUES, **filed** Mar. 10, 1975, D.C. W.D. Okla. (Oklahoma City), Doc. C-75-0214-C, *Floyd Dotson* v. *Purdy L. Sisson, Purdy Sisson Industries, Inc. and Motco, Inc.*

**D-190,281,** H. G. Sher, CHAIR; **D-191,164,** same **D-192,855,** J. P. Mengel, LOUNGE CHAIR; **D-197,645,** A. C. Ferro, CHAIR; **D-197,646,** H. J. Rose, PODIATRIST CHAIR; **D-197,844,** D. F. Rixman, CHAIR; **D-200,310,** A. C. Ferro, same; **D-205,767,** same, **D-207,054,** same, **D-220,690,** same, **Reg. No. 520,737,** (CONTOUR CHAIR-LOUNGE), Contour Chair-Lounge Co., Inc.; **Reg. No. 642,944,** (CONTOUR), same, **filed** Nov. 25, 1974, D.C. Ariz. (Phoenix), Doc. C-74-776 PHX, *Martin M. Rudolph* v. *Contour Chair-Lounge Co., Inc.*

**D-191,164.** (See D-190,281.)

**D-192,855.** (See D-190,281.)

**D-197,645.** (See D-190,281.)

**D-197,646.** (See D-190,281.)

**D-197,844.** (See D-190,281.)

**D-200,310.** (See D-190,281.)

**D-192,855.** (See D-190,281.)

**D-207,054.** (See D-190,281.)

**D-220,690.** (See D-190,281.)

**D-222,198,** M. H. Boldt, HAIR DRYER, **filed** Mar. 17, 1975, D.C., S.D.N.Y. (New York), Doc. 72-C-1722, *National Presto Industries, Inc.* v. *Sun Electric Mfg. Co., (Sun Denshi Co., Ltd.), Sun Denshi America, Inc. and Sterling-United Ltd.* Consent decree and order for injunction-A permanent injunction shall issue restraining defendants. Judgment entered in favor of plaintiff against defendants Sun Denshi Co. Ltd. and Sun Electric Mfg. Co., jointly and severally. All counterclaims of the defendants dismissed with prejudice, Mar. 17, 1975.

**Reg. No. 520,737.** (See D-190,281.)

**Reg. No. 642,944.** (See D-190,281.)

## Certificates of Correction for the Week of July 22, 1975

| | | | |
|---|---|---|---|
| 3,533,362 | 3,856,503 | 3,871,130 | 3,876,628 |
| 3,640,203 | 3,856,723 | 3,871,134 | 3,876,689 |
| 3,655,956 | 3,856,751 | 3,871,161 | 3,876,852 |
| 3,693,687 | 3,856,871 | 3,871,419 | 3,877,270 |
| 3,699,074 | 3,856,909 | 3,871,710 | 3,877,345 |
| 3,708,623 | 3,857,356 | 3,871,840 | 3,877,401 |
| 3,708,765 | 3,857,564 | 3,871,953 | 3,877,492 |
| 3,759,937 | 3,858,021 | 3,872,082 | 3,877,504 |
| 3,766,061 | 3,859,352 | 3,872,090 | 3,877,537 |
| 3,771,605 | 3,859,369 | 3,872,294 | 3,877,545 |
| 3,774,733 | 3,859,775 | 3,872,580 | 3,877,562 |
| 3,793,423 | 3,859,779 | 3,872,592 | 3,877,594 |
| 3,795,197 | 3,860,186 | 3,872,630 | 3,877,863 |
| 3,800,950 | 3,860,323 | 3,872,986 | 3,877,883 |
| 3,801,249 | 3,860,608 | 3,872,991 | 3,877,908 |
| 3,803,160 | 3,860,708 | 3,873,133 | 3,878,142 |
| 3,805,310 | 3,860,790 | 3,873,138 | 3,878,767 |
| 3,806,145 | 3,861,263 | 3,873,155 | 3,878,811 |
| 3,806,215 | 3,862,437 | 3,873,166 | 3,879,007 |
| 3,807,837 | 3,863,009 | 3,873,178 | 3,879,059 |
| 3,808,162 | 3,863,099 | 3,873,368 | 3,879,249 |
| 3,816,416 | 3,863,966 | 3,873,458 | 3,879,556 |
| 3,817,743 | 3,864,173 | 3,873,491 | 3,879,774 |
| 3,823,598 | 3,864,204 | 3,873,553 | 3,879,842 |
| 3,825,607 | 3,864,475 | 3,873,628 | 3,879,844 |
| 3,826,690 | 3,864,645 | 3,873,698 | 3,879,941 |
| 3,836,560 | 3,864,903 | 3,873,851 | 3,880,169 |
| 3,837,641 | 3,865,486 | 3,873,888 | 3,880,249 |
| 3,838,168 | 3,865,812 | 3,873,944 | 3,880,427 |
| 3,839,355 | 3,865,881 | 3,873,986 | 3,880,749 |
| 3,839,574 | 3,865,968 | 3,874,013 | 3,880,839 |
| 3,839,599 | 3,866,276 | 3,874,016 | 3,881,022 |
| 3,845,207 | 3,866,580 | 3,874,089 | 3,881,088 |
| 3,845,390 | 3,866,913 | 3,874,093 | 3,881,288 |
| 3,846,681 | 3,867,288 | 3,874,098 | 3,881,691 |
| 3,846,753 | 3,867,309 | 3,874,166 | 3,881,843 |
| 3,847,345 | 3,867,373 | 3,874,446 | 3,882,073 |
| 3,847,404 | 3,867,686 | 3,874,622 | 3,882,130 |
| 3,848,236 | 3,867,962 | 3,874,984 | 3,882,561 |
| 3,849,349 | 3,868,178 | 3,874,991 | 3,882,764 |
| 3,849,608 | 3,868,374 | 3,875,172 | 3,882,856 |
| 3,850,789 | 3,868,505 | 3,875,173 | 3,882,880 |
| 3,850,894 | 3,868,545 | 3,875,409 | 3,882,938 |
| 3,853,464 | 3,868,551 | 3,875,441 | 3,883,205 |
| 3,853,902 | 3,868,565 | 3,875,447 | 3,883,474 |
| 3,853,903 | 3,869,359 | 3,875,531 | 3,883,562 |
| 3,854,785 | 3,869,904 | 3,875,672 | 3,883,704 |
| 3,854,941 | 3,870,167 | 3,875,800 | 3,883,731 |
| 3,855,043 | 3,870,534 | 3,875,813 | 3,883,999 |
| 3,855,621 | 3,870,541 | 3,876,393 | 3,884,570 |
| 3,855,765 | | | |

## Disclaimer and Dedication

3,532,850.—*Hans J. Schulz*, Wuppertal-Vohwinkel, Germany, and *Victor H. Marcolini*, Cicero, Ill. POWER SUPPLY FOR ELECTRICAL DISCHARGE MACHINING. Patent dated Oct. 6, 1970. Disclaimer and dedication filed June 5, 1975, by the assignee, *Amsted Industries Incorporated*.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

## Dedications

3,082,079.—*David K. Bulloch* and *Deane S. Thomas*, Rochester, N.Y. SILVER RECOVERY FROM PHOTOGRAPHIC FIXING SOLUTIONS. Patent dated Mar. 19, 1963. Dedication filed May 8, 1975, by the assignee, *Eastman Kodak Company*.

Hereby dedicates to the Public the entire remaining portion of the term of said patent.

3,561,682.—*Charles H. Rex*, Marblehead, Mass. LUMINAIRE. Patent dated Feb. 9, 1971. Dedication filed May 5, 1975, by the assignee, *General Electric Company*.

Hereby dedicates to the Public the entire term of said patent.

3,657,003.—*John Thomas Kenney*, Trenton, N.J. METHOD OF RENDERING A NON-WETTABLE SURFACE WETTABLE. Patent dated Apr. 18, 1972. Dedication filed Mar. 13, 1975, by the assignee, *Western Electric Company, Incorporated*.

Hereby dedicates to the Public the entire remaining term of said patent.

3,683,547.—*Kendall L. Harden*, Anderson Township, Hamilton County, Ohio. SELF-CENTERING SPRAYING APPARATUS. Patent dated Aug. 15, 1972. Dedication filed May 2, 1975, by the assignee, *The Procter & Gamble Company*.

Hereby dedicates to the Public the entire term of said patent.

## Disclaimers

Design No. 233,918.—*Chester J. Barecki*, Grand Rapids, Mich. TRANSIT SEAT. Patent dated Dec. 17, 1974. Disclaimer filed Mar. 3, 1975, by the assignee, *American Seating Company*.

The term of this patent subsequent to Mar. 19, 1988, has been disclaimed.

3,629,681.—*David Gurwicz*, Gateshead, England. CIRCUITS FOR CONTROLLED BATTERY CHARGERS. Patent dated Dec. 21, 1971. Disclaimer filed Apr. 21, 1975, by the assignee, *Sevcon Engineering Limited*.

Hereby enters this disclaimer to claims 1 to 9 of said patent.

3,712,309.—*Raymond B. Schmitz*, Independence, Mo. STRAW CHOPPER MOUNTING FOR COMBINE. Patent dated Jan. 23, 1973. Disclaimer filed, May 7, 1975, by the assignee, *Allis-Chalmers Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,713,336.—*Theodore Bernstein*, and *Joseph G. Miller*, Madison, Wis. COMBINATION FLUID FLOW SPEED AND DIRECTION TRANSDUCER. Patent dated Jan. 30, 1973. Disclaimer filed Mar. 7, 1975, by the inventors.

Hereby enter this disclaimer to claim 6 of said patent.

3,753,513.—*Julian Pascoe Grenfell*, Weybridge, and *John Brown Buchanan*, Mytchett, England. HANDLING AND SORTING DEVICES. Patent dated Aug. 21, 1973. Disclaimer filed May 28, 1975, by the assignee, *Badalex Limited*.

Hereby enters this disclaimer to claims 1–9, inclusive, 12, 13 and 14 of said patent.

3,769,631.—*James D. Hill, Hugh E. Naylor, III, Donald L. West* and *Thomas H. Williams*, Lexington, Ky. INCREASING THROUGHPUT IN INK JET PRINTING BY DROP SKIPPING AND REDUCING INK JET MERGING AND SPLATTER USING A STAIRSTEP GENERATOR. Patent dated Oct. 30, 1973. Disclaimer filed May 23, 1975, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to claims 7–10 of said patent.

3,793,322.—*James R. Schroff*, Bronx, N.Y., and *Victor Bandurco*, Sommerville, N.J. 1,4-DISUBSTITUTED PIPERAZINES. Patent dated Feb. 19, 1974. Disclaimer filed Mar. 14, 1975, by the assignee, *USV Pharmaceutical Corporation*.

Hereby enters this disclaimer to claims 1–9, inclusive, and claim 11 of said patent.

3,795,444.—*Dennis James Glidden* and *Wayne Alan Freiert*, Rochester, N.Y. EXPOSURE CONTROL APPARATUS. Patent dated Mar. 5, 1974. Disclaimer filed Mar. 3, 1975, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to claim 1 of said patent.

---

3,813,209.—*Henry J. Venetta*, Warren, Ohio. PREHEATING OF METAL SCRAP. Patent dated May 28, 1974. Disclaimer filed Mar. 12, 1975, by the inventor.

Hereby enters this disclaimer to claims 1, 3, 4 and 10 of said patent.

---

3,817,722.—*James F. Scott*, Briarcliff Manor, N.Y. COMPOSITIONS FOR INHIBITING CORROSION AND ASH DEPOSITION IN FOSSIL FUEL BURNING EQUIPMENT. Patent dated June 18, 1974. Disclaimer filed Mar. 17, 1975, by the assignee, *The Perolin Company, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

---

3,831,460.—*Francis M. Linley, Jr.*, Easton, Conn. ANTI-BACKLASH NUT. Patent dated Aug. 27, 1974. Disclaimer filed Jan. 13, 1975, by the assignee, *Universal Thread Grinding Company*.

Hereby enters this disclaimer to claims 14, 16 and 17 of said patent.

3,833,845.—*Christopher R. Smallbone*, Port Colborne, and *Laurent W. Beaudoin*, Welland, Ontario, Canada. TOUCH BUTTON CONTROL SYSTEM. Patent dated Sept. 3, 1974. Disclaimer filed Mar. 17, 1975, by the assignee, *General Signal Corporation*.

Hereby enters this disclaimer to claims 4–11 of said patent.

---

3,836,709.—*John Grear Hutchison*, Catonsville, Md. PROCESS AND APPARATUS FOR PREPARING PRINTING PLATES USING A PHOTOCURED IMAGE. Patent dated Sept. 17, 1974. Disclaimer filed Mar. 4, 1975, by the assignee, *W. R. Grace & Co.*

Hereby enters this disclaimer to claims 1 through 18 and 22 of said patent.

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3,847,016.—*Janis Gunars Ziedonis*, Cranbury, N.J. ULTRASONIC TRANSDUCER ASSEMBLY. Patent dated Nov. 12, 1974. Disclaimer filed Apr. 30, 1975, by the assignee, *Hoffmann-La Roche Inc.*

Hereby enters this disclaimer to claim 7 of said patent.

---

3,854,323.—*Daniel P. Hearn*, Richardson, and *Thomas K. Perkins*, Dallas, Tex. METHOD AND APPARATUS FOR MONITORING THE SAND CONCENTRATION IN A FLOWING WELL. Patent dated Dec. 17, 1974. Disclaimer filed June 2, 1975, by the assignee, *Atlantic Richfield Company*.

Hereby enters this disclaimer to claims 1, 5, 6, 7, 8, 9, 10, 11, 12 and 13 of said patent.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF JUNE 21, 1975

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 9-23-74 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 10-1-74 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 11-1-74 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 10-7-74 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 10-4-74 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales. | 12-4-74 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 7-2-74 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 10-4-74 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating. | 11-29-74 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 12-2-74 |
| DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts. | 5-2-74 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 12-13-74 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks. | 10-18-74 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 1-2-75 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication. | 10-8-74 |
| GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines. | 12-10-74 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during July 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,840,821 to 2,845,624 inclusive
Plant Patents..... Numbers 1,722 to 1,739 inclusive

# REISSUES

JULY 22, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## Re. 28,486
## APPARATUS FOR ARTIFICIAL RESPIRATION OR NARCOSIS

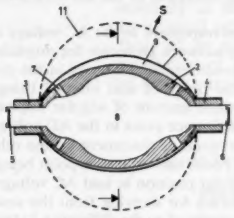
**Henning M. Ruben, Copenhagen, Denmark, assignor to Ruth L. Hesse, Testa-Laboratorium, Copenhagen, Denmark**

**Original No. 3,650,268, dated Mar. 21, 1972, Ser. No. 839,592, July 7, 1969. Application for reissue Nov. 28, 1973, Ser. No. 419,889**

**Claims priority, application Sweden, July 8, 1968, 9387/68**

**Int. Cl. A61m** *16/00*

**U.S. Cl. 128—145.7** **19 Claims**



**1.** An insufflation apparatus for performing artificial respiration in narcosis, which apparatus includes pumping means for moving gas from a gas source to a patient, the pumping means having a gas containing portion defined by enclosing walls, inlet means on said pumping means for connecting the latter to a gas source and including check valve means for preventing back flow of the gas from the pumping means to the gas source, and outlet means on said pumping means connecting the pumping means to the air ducts of a patient including check valve means for preventing gas from flowing from the air ducts of the patient into the pumping means, said outlet means including an outlet conduit, the improvement which comprises: a first wall section and a second wall section forming the walls of the gas containing portion of the pumping means, said first wall section consisting of a membrane that is more resilient than said second wall section, said membrane forming a portion of the wall of said outlet conduit and being disposed between said check valve means of said outlet means and said second wall section, said membrane being movable between an unexpanded position when the gas pressure in the pumping means is below a predetermined pressure and, under the influence of the gas when the pressure thereof exceeds said predetermined pressure, an expanded position, said membrane thus constituting a means for increasing the volume of the gas containing portion of the pumping means, in consequence of which the pressure of the gas in the pumping means is limited to said predetermined pressure.

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## Re. 28,487
## CRIMPED FLAT MATERIAL FOR FILTER PLUGS

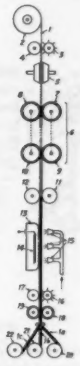
**Paul Adolf Müller, Triesenberg, Liechtenstein, assignor to Celfil Company Establishmant, Vaduz, Liechtenstein**

**Original No. 2,995,481, dated Aug. 8, 1961, Ser. No. 502,016, Apr. 18, 1955. Continuation of Ser. No. 422,872, Nov. 2, 1964, abandoned, which is a continuation of Ser. No. 254,039, Jan. 21, 1963, abandoned, which is a continuation of Ser. No. 173,611, Feb. 9, 1962, abandoned. Application for reissue Jan. 24, 1968, Ser. No. 700,300**

**Int. Cl. A24d** *01/04*

**U.S. Cl. 131—261 B** **12 Claims**

**1.** As an article of manufacture, an absorbent sheet for making filters for cigarettes, comprising a web of an elongated fibrous strip material having a plurality of parallel adjacent strips of alternately greater and lesser density of said strip material extending substantially parallel to the longitudinal dimension of said web and having superposed thereonto crimping grooves, the crimping ratio, taken transversely to the direction of the grooves, of a strip when in crimped condition



to a crimped strip when ironed flat being in the range of 1:1 to 1:2, said strips being provided with a plurality of spaced cracks therein running substantially in the direction of said grooves.

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## Re. 28,488
## MILK FERMENTING PRODUCT

**Stewart M. Farr, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.**

**Reissued No. Re. 28,276, dated Dec. 17, 1974, Ser. No. 417,134, Nov. 19, 1973.**

**Original No. 3,420,742, dated Jan. 7, 1969, Ser. No. 404,526, Oct. 16, 1964. Continuation-in-part of Ser. No. 285,858, June 6, 1963, abandoned. Application for re-reissue Sept. 16, 1974, Ser. No. 506,424**

**Int. Cl.[2] C12K** *3/00*

**U.S. Cl. 195—59** **9 Claims**

**4.** A stabilized, mixed bacteria concentrate **containing at least about $10 \times 10^9$ cells/ml each** consisting essentially of a substantially neutralized mixture of two types of bacteria **which have been separately incubated, concentrated and then mixed**, the first type being selected from the group consisting of Streptococcus lactis, Streptococcus cremoris, Lactobacillus bulgaricus and Streptococcus thermophilus **which has been incubated in a culture medium containing skim milk so as to produce lactic acid and wherein during the incubation the lactic acid produced has been neutralized with a neutralizing agent to maintain the growth of the bacteria,** and the second type being selected from the group consisting of Streptococcus citrovorus and Streptococcus paracitrovorus **which has been incubated in skim milk or a digest milk, said bacteria having been separated from the media and concentrated in a centrifuge**, said concentrate being stabilized by the admixture of a stabilizing agent and a nutrient medium so that the concentrate is stabilized against rapid loss of viability, said concentrate being frozen so that it can be stored for a long period of time without major loss in the viability of the bacteria.

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Claim 4 was deleted in Re. 28,276, but is reinstated in this reissue with amendments (matter printed in bold face).

Re. 28,489

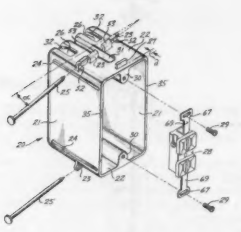
## MOLDED ELECTRICAL JUNCTION BOX

Edgar C. Schindler, Puyallup, and John C. McEachron, Tacoma, both of Wash., assignors to Nelco Corporation, Orting, Wash.

Original No. 3,740,451, dated June 19, 1973, Ser. No. 265,342, June 22, 1972. Division of Ser. No. 69,266, Sept. 3, 1970, Pat. No. 3,701,451. Application for reissue July 23, 1973, Ser. No. 382,083

Int. Cl.[2] H02G *3/12*

U.S. Cl. 174—58 17 Claims



*3. A molded plastic electrical junction box having a wall structure defining a plurality of front-to-rear walls which terminate in a common frontal plane of the box and are interconnected with one another to define a chamber within the box that opens to the ambient surroundings of the box through the frontal plane thereof, a pair of which front-to-rear walls are oppositely disposed to one another and taper relatively toward one another in the direction relatively rearwardly away from the frontal plane of the box, and have corresponding laterally outstanding ribs thereon which extend in the front-to-rear direction of the box and define a pair of flat surfaces thereon that are disposed in spaced parallel planes extending perpendicular to the frontal plane of the box, said ribs providing blunt bearing surfaces having at least as much bearing area at their rearward portions as there is at their forward portions and formed to resistingly bear against the surface of a mounting stud throughout at least their rearward portions so that the frontal plane of a mounted box is generally perpendicular to the surface of the mounting stud, and means on the said box for anchoring said box to a mounting stud, such that the anchor point between the box and a mounting stud is spaced from both the body of the rib and the rearward portion of said rib by an amount sufficient to insure that the rearward portion of said rib is not loaded by mounting forces to an extent that said rearward portion substantially deforms said stud whereby, when the box is mounted on a stud, the box is oriented so that the frontal plane of the box is substantially perpendicular to the surface of the stud to which the box is attached.*

Re. 28,490

## NETWORK RECLOSING RELAY

Muchuan M. Chen, Springfield, and William C. Kotheimer, Lansdowne, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Original No. 3,704,392, dated Nov. 28, 1972, Ser. No. 222,526, Feb. 1, 1972. Application for reissue Sept. 26, 1974, Ser. No. 509,502

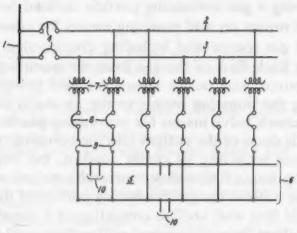
Int. Cl. H02h *3/26*

U.S. Cl. 317—23 12 Claims

1. For use in a power distribution system including an alternating current secondary network [ applied ] *supplied* at a plurality of points from one or more primary feeders, each of said points being connected to a primary feeder by means of a network protector and a transformer, a static relay for supervising a closing operation of the network protector comprising:

a. first means responsive to the AC voltage on the network side of the network protector for providing a first signal during a predetermined interval in the cycle of said AC voltage, the limits of said interval being defined by a predetermined amount of angular displacement on one side of a reference point in the AC voltage cycle and by a predetermined displacement on the other side of said reference point, said reference point being at a predetermined angular position in said AC voltage cycle;

b. second means for deriving from the system a first AC signal proportional to the difference between the voltage on the transformer side of the network protector and the voltage on the network side of the network protector;



c. third means for providing a second signal at a predetermined point in the cycle of the first AC signal, the angular position of said predetermined point in the cycle of the first AC signal being equivalent to said angular position of the reference point in the AC voltage cycle;

d. fourth means for providing a third signal only when the magnitude of the first AC signal is above a predetermined threshold level; and

e. fifth means coupled to said second, third and fourth means for providing an output signal upon the coincidence of said first, second and third signals.

# PLANT PATENTS

## GRANTED JULY 22, 1975

**Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.**

**3,745**
**CARNATION PLANT**
**Takeshi Yoichi Yonemoto, 1328 Henderson Ave., Santa Clara, Calif. 95051**
**Filed July 3, 1974, Ser. No. 485,383**
**Int. Cl. A01h** *5/00*
**U.S. Cl. Plt.—70** **1 Claim**

1. A new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its small red-on-white flowers, which are miniatures of those of its parent variety, by its profuse year around production of blossoms, and by the long lasting quality of the blossoms as cut flowers.

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**3,746**
**CARNATION PLANT**
**Takeshi Yoichi Yonemoto, 1328 Henderson Ave., Santa Clara, Calif. 95051**
**Filed July 3, 1974, Ser. No. 485,384**
**Int. Cl. A01h** *5/00*
**U.S. Cl. Plt.—70** **1 Claim**

1. A new and distinctive variety of carnation plant, substantially as herein shown and described, characterized by the purple and white coloration of the flower petals.

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**3,747**
**CARNATION PLANT**
**Takeshi Yoichi Yonemoto, 1328 Henderson Ave., Santa Clara, Calif. 95051**
**Filed July 3, 1974, Ser. No. 485,385**
**Int. Cl. A01h** *5/00*
**U.S. Cl. Plt.—70** **1 Claim**

1. A new and distinct variety of carnation plant, substantially as herein shown and described, characterized by the light pink coloring of its blooms which are of medium size and which have many outwardly projecting guard petals splotched with white at their outer ends, and by its profuse and continuous production of blossoms when grown in greenhouse for cut flowers.

# PATENTS

## JULY 22, 1975

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 221-233 | 3,895,431 |
| 228-157 | 3,895,436 |
| 066-091 | 3,895,489 |
| 198-011 | 3,895,702 |
| 317-101 DH | 3,895,719 |
| 260-033.6 R | 3,895,826 |
| 335-296 | 3,895,869 |
| 021-074 R | 3,895,928 |
| 096-115 R | 3,895,954 |
| 235-151.21 | 3,896,041 |
| 106-149 | 3,896,054 |
| 252-301.2 R | 3,896,138 |
| 427-306 | 3,896,252 |
| 338-048 | 3,896,284 |
| 053-030 | 3,896,288 |
| 260-078.3 R | 3,896,303 |
| 215-219 | 3,896,335 |
| 317-068 | 3,896,352 |
| 317-103 | 3,896,353 |
| 317-258 | 3,896,354 |

# PATENTS

## GRANTED JULY 22, 1975

## GENERAL AND MECHANICAL

**3,895,396**

### EXPANDABLE PROTECTIVE DEVICE

**John Gust Amarantos, 940 Pacific Ave., Apt. C, Long Beach, Calif. 90806**

**Filed Feb. 4, 1974, Ser. No. 439,351**
**Int. Cl.[2] A41D** *13/00*
**U.S. Cl. 2—2** **4 Claims**

**1.** A protective device that may be worn in a compact encircling position about the waist of a user and in an emergency inflated by use of compressed air or a gas for the major portion of the device to unfurl and move longitudinally over the user to a protecting position, said device including:

a. first and second cylindrical sheets of a pliable material that have closed ends;

b. a plurality of spaced strips sealed to adjacent interior surfaces of said first and second sheets, with said strips being so disposed as to define a compressed air and gas receiving passage that extends transversely intermediate said ends of said sheet;

c. a plurality of second passages also defined by said strips between said sheets that are at all times in communication with said transversely extending passage and a plurality of cells also defined by said strips that are adjacently disposed to said second passage an opening in said strips between each of said cells and an adjacent said second passage;

d. a plurality of circumferentially spaced longitudinally extending springs that at all times tend to maintain said sheets in a compact, generally donut shaped configuration and in which said configuration said device is worn by said user;

e. a source of compressed gas or air secured to said device;

f. a normally closed valve in communication with said source and said transversely extending passage with said valve when opened by the user permitting compressed gas or air to flow into said transversely extending passage and said second passage and through said opening in said strips into said cells, and said cells when they are inflated deforming said spring means to permit said device to unfurl upwardly and downwardly relative to said transverse passage to envelope desired portions of the user to protect the latter against shock or a change in the surrounding environment that would be detrimental to said user.

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**3,895,397**

### FLEXIBLY HINGED EYE PIECE HEADGEAR

**Donald J. Douglas, 10 Glasgow Rd., White Bear Lake, Minn. 55110**

**Filed Jan. 30, 1974, Ser. No. 438,039**
**Int. Cl. A61f** *9/02*
**U.S. Cl. 2—14 W** **10 Claims**

**1.** Headgear comprising a sheath structure having lateral eye accommodating portions, each said eye accommodating portion being connected to a nose accommodating portion of said headgear, each said connection between a said eye accommodating portion and said nose accommodating portion being sufficiently flexible to function as a hinge for tilting a said eye accommodating portion, each said eye accommodating portion comprising a substantially flat eye vision area adapted to be placed in spaced relationship over an eye of a wearer and a temple area elevation curtain outwardly from said substantially flat area, an outwardly extending substantially flat flange about perimeter portions of said sheath structure, said flange being substantially non-parallel to said substantially flat eye vision areas at the lateral extremities of said flange adjacent said temple area elevation curtains said flange being adapted to be placed substantially into a single plane by tilting said eye accommodating portions, which then causes said substantially flat area of each said eye accommodating portion to be at an angle to said plane, and said substantially flat area of each said eye accommodating portion being adapted to be tilted into a single plane which then causes said outwardly extending flange to no longer lie in a single plane.

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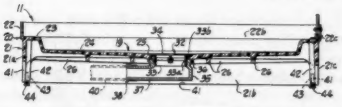
**3,895,398**

### FREE-STANDING SHOWER STALLS

**Bernard E. Mustee, Cleveland, Ohio, assignor to E. L. Mustee & Sons, Inc., Cleveland, Ohio**

**Division of Ser. No. 158,927, July 1, 1971, Pat. No. 3,751,737, which is a division of Ser. No. 864,716, Oct. 8, 1969, Pat. No. 3,609,773. This application May 10, 1973, Ser. No. 359,078**
**Int. Cl. A47k** *3/22*
**U.S. Cl. 4—146** **3 Claims**



**1.** A shower stall comprising:

a. a base having a central body portion which defines a shower stall floor, and a support flange formed about the periphery of said central body portion and extending downwardly beyond said central body portion to maintain said central body portion spaced above a floor upon which said base can be positioned;

b. a drain extending down through said central body portion to define a drain opening in said shower stall floor;

c. a drain fitting elbow below said shower stall floor having a portion connected to said drain body and an arm that extends transverse to a vertical axis toward a part of said support flange, said elbow being rotatable about a vertical axis so that said arm can extend in any desired direction,

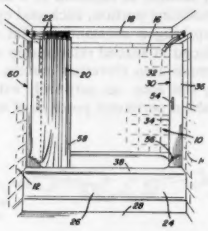
d. a drain pipe connected to said arm of said drain fitting elbow and extending through an opening of said flange, and

e. wall structure extending upwardly from said base and secured thereto.

## 3,895,399
## TUB SHOWER SPRAY DIVERTER

Gary C. Giarrante, 1861 Marlboro, Joliet, Ill. 60435

Filed Apr. 12, 1974, Ser. No. 460,485
Int. Cl. A47k 3/22
U.S. Cl. 4—149 16 Claims

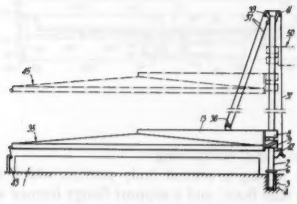


1. In combination with a shower enclosure including an upright structural member defining one upright side of an entrance and exit opening for said enclosure and a spray diverting curtain supported for movement of one upstanding edge portion thereof toward and away from said side across said opening, said structural member having flange means associated therewith defining an upstanding flange projecting at least slightly into said opening and having an upstanding free edge portion and a slot formed in a lower end portion of said free edge portion opening through the latter and of a width to snugly receive the corresponding portion of said curtain upstanding edge portion therein.

## 3,895,400
## COVERING FOR RECREATIONAL AREAS

Raymond Robinson Kelcey, 12 Moore St., Coburg, Victoria, 3058, Australia

Filed Mar. 14, 1974, Ser. No. 451,378
Claims priority, application Australia, Mar. 19, 1973, 2631/73
Int. Cl. E04h 3/16, 3/18
U.S. Cl. 4—172.11 7 Claims

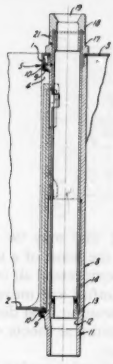


1. A cover and cover support apparatus for a recreation area and comprising:
- a single upright support member adapted to be positioned adjacent a recreation area;
- means for mounting said single upright support member for rotation about a vertical axis thereof;
- a horizontally extending cover having a configuration, as viewed from above, sufficient to cover said recreation area;
- said cover having adjacent the center thereof an integral hub;
- a single boom integrally attached along the entire length thereof to the top of said cover and extending from said hub to a position adjacent an edge of said cover;
- bracket means attached to at least one of said cover and said boom for mounting said cover for vertical movement along said single upright support member; and
- means operatively connected to said boom and said single upright support member for selectively vertically moving said cover, said boom and said bracket means along said single upright support member from a first raised position to a second lowered position.

## 3,895,401
## DRAIN STRUCTURE

Hank Walraven, P.O. Box 1155, Sausalito, Calif. 94965

Filed Apr. 22, 1974, Ser. No. 462,998
Int. Cl. E03c 1/232
U.S. Cl. 4—198 10 Claims

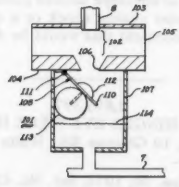


1. A drain structure for a sink having sidewalls, a top wall and a bottom wall comprising:
- a housing secured to and positioned outwardly of one of said sidewalls,
- a drain conduit at the lower end of said housing and outwardly of said one side,
- a screen positioned substantially coplanar with said one sidewall and extending upwardly from said bottom along a substantial portion of the depth of said sidewall at said housing, and
- quick release means on said screen for removably securing said screen in said position relative to said one sidewall.

## 3,895,402
## REMOTELY LOCATED APPARATUS FOR MAINTAINING THE WATER LEVEL WITHIN A SWIMMING POOL

Littleton Dennis Page, Tucson, Ariz.

Division of Ser. No. 381,360, July 20, 1973, Pat. No. 3,848,627, which is a continuation-in-part of Ser. No. 220,976, Jan. 26, 1972, Pat. No. 3,759,286. This application July 29, 1974, Ser. No. 492,468
Int. Cl. E04h 3/16
U.S. Cl. 4—172.17 6 Claims



1. In a swimming pool water circulation and filtration system having a suction line, a pump, a return line, makeup water line and a control system for regulating the operation of said pump, wherein said pump draws the pool water through said suction line, pumps the pool water through the filtration system and back into the pool through said return line, the improvement comprising in combination:

a. means for directing the flow of water from the end of said makeup line in a generally downward direction;
b. an apertured base, the aperture of said base being vertically displaced from the opening of said makeup line by an air gap and in general vertical alignment therewith;
c. connecting means disposed intermediate said base and said return line for conveying makeup water from said aperture to said return line; and
d. a float valve disposed within said connecting means to inhibit a flow of water from said return line through said aperture; whereby, the air gap inhibits any flow of pool water into said makeup line and said return line may be pressured by said pump.

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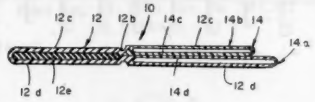
**3,895,403**
**PATIENT ORIENTING DEVICE**
**Sanford Davis, Stoney Creek Ln., Colts Neck, N.J. 07722**
**Filed Apr. 5, 1974, Ser. No. 458,171**
**Int. Cl. A61g** *7/10*
**U.S. Cl. 5—81 R** **11 Claims**




1. A patient orienting device for hospital patients and the like comprising a resilient body provided with two spaced opposing edges arranged adjacent to each side of a patient when the patient is supported by said resilient body, first and second inflatable bodies being provided along each edge of said resilient body, each first inflatable body being arranged for at least partially lifting said resilient body and the patient positioned thereon in response to inflation of the respective first inflatable body, each second inflatable body being arranged to be inflated subsequent to substantial inflation of an associated first inflatable body, at least a portion of each second inflatable body being at least partially supported by said associated first inflatable body and having an opposite other portion thereof in pushing contact against the patient, the inflatable bodies in each pair being in pushing contact with each other and together arranged to bear against and push the patient relative to said resilient body when the respective pair of inflatable bodies are inflated; and pneumatic air supply means for independently and selectively inflating and deflating said bodies on each side of said resilient body to a desired level of pressure to turn the patient or to support the latter in an intermediate inclined position, whereby a patient may be fully turned or inclined in the direction of one or the other of said exposed edges.

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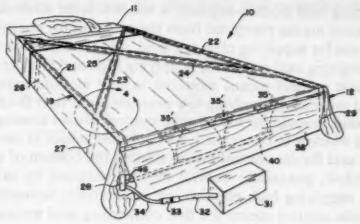
**3,895,404**
**BED MAKING APPARATUS**
**Nathan R. Wilson, 1144 Rhode Island St., San Francisco, Calif. 94107**
**Filed Feb. 11, 1974, Ser. No. 441,443**
**Int. Cl.[2] A47G** *9/00*; **A47C** *27/08*
**U.S. Cl. 5—334 R** **7 Claims**

1. For use in making up the bedding covering a bed, the combination of a plurality of overlying covering layers forming a bedding adapted to drape over and conform with the upper and side surfaces of the bed, a straightening unit carried between at least two layers of the beeding, the straightening unit including a plurality of elongate hollow inflatable tubular members, means mounting the tubular members for a limited range of movement relative to the adjacent layers of the bedding, said tubular members being joined together in a pattern which encompasses a substantial area of the bedding, said tubular members when deflated being substantially non-rigid to permit said bedding to be folded, and when inflated with a charge of gas said tubular members are rigid to cause said bedding to straighten out over said surface of the bed, charging means to selectively inject and release a charge of gas




under pressure into and from said tubular members, and means forming vent holes on the undersides of the tubular members for bleeding gas therefrom to form a pressurized gas pocket underneath said bedding.

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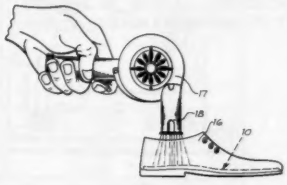
**3,895,405**
**ADJUSTABLE INSOLE AND METHOD**
**Clyde A. Edwards, 2722 W. Jackson St., Muncie, Ind. 47304**
**Filed Sept. 12, 1974, Ser. No. 501,554**
**Int. Cl. A43d**
**U.S. Cl. 12—146 M** **5 Claims**




1. A method of fitting an insole in a shoe and comprising the steps of:
placing in a shoe a flexible insole member;
heating said member to a temperature sufficient to cause said member to lose at least some of its resiliency;
placing a foot in the shoe before said member has regained its resiliency; and
taking steps with the foot in the shoe until the member has regained its resiliency.

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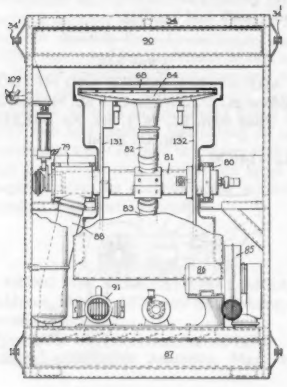
**3,895,406**
**AUTOMATIC WINDOW WASHER**
**Robert D. Fannon, Jr., Columbus, Ohio, assignor to Harsco Corporation, Harrisburg, Pa.**
**Continuation-in-part of Ser. No. 363,114, May 23, 1973, abandoned, and Ser. No. 256,610, May 24, 1972, abandoned, which is a division of Ser. No. 107,957, Jan. 20, 1971, Pat. No. 3,715,774. This application Oct. 16, 1973, Ser. No. 406,855The portion of the term of this patent subsequent to Feb. 13, 1990, has been disclaimed.**
**Int. Cl.[2] A47L** *1/04*
**U.S. Cl. 15—302** **16 Claims**

1. An automatic window washer for buildings having a mobile supporting unit on the roof of the building, at least one cleaning module, nozzles in said module for spraying cleaning fluid on the windows, means in said module for supplying cleaning fluid under pressure to said nozzles, a squeegee in said module above said nozzles, means in said module for moving said squeeegee into and out of engagement with a window being cleaned, vacuum means in said module cooperating with said squeegee for removing residue therefrom, means in said module for supplying high pressure air, means

in said module for supplying low pressure air, means on said module engaging vertical tracks on the building disposed adjacent the windows to be washed, resilient non-extensible means extending from said module to the roof unit for positioning said module adjacent a window to be washed, electric control means energized from the roof unit for energizing said means for supplying cleaning fluid, said vacuum means and for energizing said means for supplying high and low pressure air, fluidic control means mounted in said module energized by said means for supplying low pressure air, a start fluidic sensor in said module for said fluidic control means sensing the top of a window to be cleaned, a stop fluidic sensor in said module for said fluidic control means sensing the bottom of a cleaned window, pneumatic control means energized by said means for supplying high pressure air sequentially actuated by said fluidic control means for first connecting said means for supplying cleaning fluid to said nozzles and then for actuating said



means for moving said squeegee, said start sensor starting window cleaning and said stop sensor stopping window cleaning.

**2.** An automatic window washer as described in claim **1**, said fluidic control means including a counter having a start position connected to said means for supplying low pressure air, said start sensor starting said counter and connecting said means for supplying cleaning fluid to said nozzles, said counter after a predetermined interval actuating said pneumatic control means and moving said squeegee into engagement with a window.

**3.** An automatic window washer as described in claim **2**, said counter actuated by said stop sensor after a predetermined interval disconnecting said means for supplying cleaning fluid to said nozzles and thereafter after a predetermined interval said stop sensor actuating said pneumatic control means and moving said squeegee out of engagement with the window.

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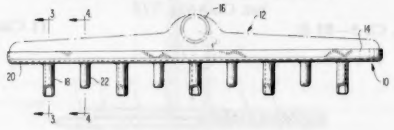
**3,895,407**
**SHAG RUG ADAPTER**
**Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.**
**Filed July 17, 1973, Ser. No. 380,026**
**Int. Cl. A47l 9/02**
**U.S. Cl. 15—397** **14 Claims**

**1.** In a shag rug vacuum cleaning tool comprising:
1. a housing having
a. a work face adapted to be brought in contact with shag rugs to clean them,
b. an air-tight chamber therewithin, and
c. a passageway adapted to place said chamber in communication with a vacuum source; and
2. a plurality of rake tines each of which
a. is fixedly mounted on said work face of said housing and
b. contains a passageway leading from said chamber in said housing to the end of said rake tine removed from said work face,
the improvements
a. wherein said rake tines have means thereon for directing the vacuum pressure from each of said tines
i. in a plane parallel to said work face,
ii. in a direction parallel to the direction of travel of the cleaning tool when in normal use, and
iii. in the direction opposite to the direction in which the vacuum pressure from the adjacent tine or tines is directed; and



b. wherein said rake tines and the means thereon for directing the vacuum pressure from each of said tines are located on said work face such that the oppositely directed means on adjacent tines are close enough so that, when the cleaning tool is used to clean a shag rug, the piles of the shag rug located between two of said tines are subjected to a shearing action from the simultaneous application in opposite directions of the vacuum pressure from the adjacent tines.

**6.** A shag rug vacuum cleaning tool as claimed in claim **1** and further comprising a plurality of solid rake fingers mounted on said work face of said housing intermediate said rake tines and adapted to comb the pile on a shag rug as the tool is drawn through it and to act as a divider between the oppositely directed air currents flowing to said rake tines when vacuum is supplied to said chamber.

**7.** A shag rug vacuum cleaning tool as claimed in claim **6** wherein said housing further has a plurality of lint slots therein intermediate said rake tines tines said work face of said housing.

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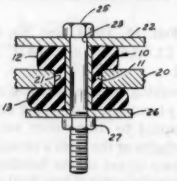
**3,895,408**
**RESILIENT MOUNTING**
**Charles J. Leingang, 1535 W. 42 St., Erie, Pa. 16509**
**Filed Jan. 30, 1974, Ser. No. 438,120**
**Int. Cl.² B65D 7/48**
**U.S. Cl. 16—2** **8 Claims**



**1.** A resilient mounting comprising:
a. a tubular bushing of elastomeric material having a central body portion and opposite end portions, said body portion having an exposed outer surface, one of said end portions being an enlarged head projecting radially outside the body portion and the other end portion being an

elongate tubular skirt extending axially from the body portion of the bushing; and

b. a rigid tubular sleeve disposed within and bonded to the bushing, the sleeve having one end terminating substantially flush with the head of the bushing and having its other end terminating adjacent the skirt of the bushing,

the tubular skirt having an internal diameter that (i) throughout the length of the skirt is at least equal to the internal diameter of the body portion of the bushing and (ii) adjacent the sleeve is greater than the outside diameter of the sleeve, the wall of the skirt being arched radially outward beyond the outside diameter of the body portion with the end of the skirt remote from the body portion tapering radially inward to an outside diameter substantially equal to the outside diameter of the body portion.

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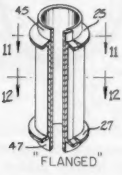
**3,895,409**

## SPACER GROMMET AND METHOD OF MANUFACTURE THEREOF

**Frank Kwatonowski, Somerville, N.J., assignor to Johns-Manville Corporation, Denver, Colo.**

**Filed Aug. 31, 1973, Ser. No. 393,372**
**Int. Cl. B65d** *7/48*
**U.S. Cl. 16—2** **12 Claims**




1. A spacer grommet comprising a single strip of sheet material and having

a. a core composed of at least one layer of said sheet material, said core surrounding the axis of and defining an axial opening through said spacer grommet;

b. a spacer segment composed of at least one layer of said sheet material, said spacer segment

i. being disposed radially outwardly from and adjacent to said core; axial

ii. cooperating with said core to form a shoulder at each axis end of said segment; and

c. said core having at each axial end thereof a locking portion, each locking portion extending axially beyond the corresponding shoulder of said spacer segment, the amount of extension being such that said locking portion when turned radially outwardly will cooperate with said shoulder to retain said spacer grommet in its operative position.

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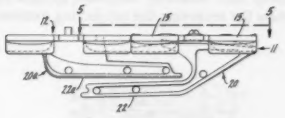
**3,895,410**

## MASTER SLIDE FOR DRAPERY

**Henry Znamirowski, Ellicott City, and William Vanburen Fielder, Jr., Westminster, both of Md., assignors to Roper Corporation, Kankakee, Ill.**

**Filed July 19, 1974, Ser. No. 489,998**
**Int. Cl. A47h** *1/04;* **E05d** *13/02, 15/06*
**U.S. Cl. 16—93 D** **8 Claims**

1. In a master slide for use on a slotted drapery rod, the combination comprising a slide body having runners along its upper edge for registering with the slot in the rod and having a depending skirt hanging below rod level, the runners being formed to maintain the skirt in upright position, a bracket having a base portion and an integral supporting arm, the base portion having a mounting surface seating on the front of the skirt for cantilevered support of the leading edge of a section of drapery, the mounting surface on the bracket and the face of the depending skirt being formed in a plurality of mating scallops dimensioned to permit register in a selected one of a plurality of horizontal positions thereby to control the degree of horizontal extension of the bracket, and the drapery thereon, with respect to the slide body, the mounting surface




of the bracket being relatively rockered in a horizontal plane with respect to the face of the skirt so as to permit inward and outward angular adjustment of the arm when the bracket is in the selected position on the slide body, and screw means for clamping the bracket onto the face of the skirt in the selected position and angle.

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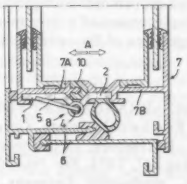
**3,895,411**

## HINGE, IN PARTICULAR FOR COUPLED WINDOW CONSTRUCTIONS

**Lauri Matti Ulrik Stark, Helsinki, Finland, assignor to Oy. Nokia AB, Helsinki, Finland**

**Filed Dec. 18, 1973, Ser. No. 425,765**
**Claims priority, application Finland, Dec. 29, 1972, 3705/72**
**Int. Cl. E05d** *7/04*
**U.S. Cl. 16—131** **3 Claims**




1. An improved hinge for two components connected pivotally to each other, in particular for the sash halves of a coupled window casement, which hinge comprises at least two hinge blades formed with bearing bushings, and a connecting pivot pin which is rotatably mounted in the bearing bushings, the improvement residing in that the pivot pin is of oval cross-section with the length of the longer axis of the oval section substantially corresponding to the diameter of the interior of the bearing bushings so as to prevent relative movement of the hinge blades in directions along said longer axis and the length of the shorter axis smaller than the diameter of the interior of the bearing bushings so as to permit relative movement of the hinge blades in directions along said shorter axis.

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**3,895,412**

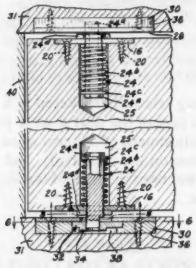
## PIVOT ASSEMBLY

**Larry K. Johnson, Morrison, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.**

**Continuation-in-part of Ser. No. 352,878, April 20, 1973, abandoned. This application Mar. 11, 1974, Ser. No. 449,321**
**Int. Cl.² E05D** *7/08*
**U.S. Cl. 16—151** **9 Claims**

1. The pivot assembly for a door member, the pivoted vertical edge of which when the door member is in the closed condition is in substantial abutting relation with a complementary vertical door frame member, said assembly including; a

pintle mechanism for attachment to either the corner portion of a door member or a door frame member, and including a vertically disposed pintle device having an extremity adapted to project from the edge surface of said member; and camming means carried by the other of said door or frame members and including a base member having a recess therein defined by an internal peripheral cam surface of predetermined non-circular contour, a pintle accommodating cam member slidably and rotatably disposed in said recess, and including means for receiving the projecting extremity of said



pintle device in non-rotating coupled engagement, said cam member further including a plurality of cam surface engaging lobes, such that rotation of the door member in either direction incident to opening will produce relative rotation of said pintle member and said cam member with respect to said base member, which rotation causes the lobes on said cam member to engage said cam surface to produce longitudinal movement of said cam element and said pintle mechanism relative to said base member, which movement is adapted to produce corresponding lateral displacement of a door member relative to a frame member, regardless of the opening direction.

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**3,895,413**

**MOUNTING ARRANGEMENT FOR DOORS**

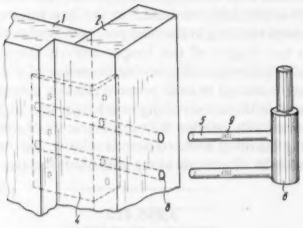
**August Buergers, Erkelenz-Gerderath, Germany, assignor to Europatent S.A., Luxemburg, Luxemburg**

**Filed Aug. 27, 1974, Ser. No. 500,995**

**Claims priority, application Germany, Sept. 7, 1973, 2345232**

**Int. Cl.[2] E05D 5/10**

**U.S. Cl. 16—168** **10 Claims**



**1.** A mounting assembly for use in mounting a door on a door frame comprising a plastic holder mounted on a posterior part of said door frame, said plastic holder having elongated holes which are aligned with corresponding openings in the adjacent part of the door frame, a hinge support having elongated lugs which are constructed and arranged to pass through said openings and to be received in said elongated holes in said plastic holder, said elongated holes being smaller than said lugs so as to provide an interference fit therebetween, said plastic holder being made of a plastic material constructed such that the walls of said elongated holes yield elastically to biasingly clamp said lugs in said holes upon forcible insertion of said lugs in said holes, said lugs being provided with means for increasing the frictional drag between said lugs and said elongated holes.

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**3,895,414**

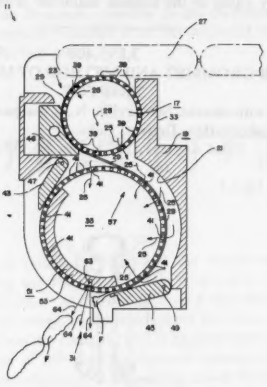
**SAUSAGE CASING BREAKER**

**Thomas A. Klyce, Memphis, Tenn., assignor to Ranger Tool Co., Inc., Ellendale, Tenn.**

**Filed Sept. 14, 1973, Ser. No. 397,394**

**Int. Cl. A22b**

**U.S. Cl. 17—1 F** **6 Claims**



**1.** The combination with apparatus for peeling a continuous string of casing from sausage and the like of casing breaker means, said casing breaker means comprising first means for engaging the continuous string of casing to peel the casing from the sausage, second means for engaging the continuous string of casing after the casing has been peeled from the sausage by said first means, and means for applying tension to the meat-free continuous string of casing between said first and second means to subsequently sever the meat-free continuous string of casing into casing fragments to facilitate further handling of the casing.

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**3,895,415**

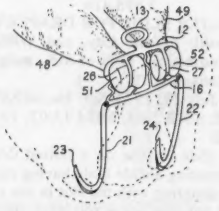
**RETAINER FOR DRESSED POULTRY**

**Anthony J. Volk, 173 E. Syracuse St., Turlock, Calif. 95380**

**Filed June 4, 1974, Ser. No. 476,297**

**Int. Cl. A22c 21/00**

**U.S. Cl. 17—11** **12 Claims**



**1.** A limitedly flexible dressed poultry trussing retainer comprising spaced upper and lower bars having the ends thereof connected by end connections and a pair of spaced locking means extending between the bars intermediate the

ends thereof for extension along the creases of the hocks of fowl with the bars disposed above and below the legs of the fowl adjacent the hocks, and a pair of hooks with each hook connected by a shank to a respective end of said lower bar for extension into the carcass of a fowl for engagement with bone structure thereof to truss the fowl.

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**3,895,416**

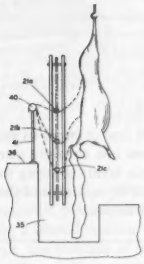
## APPARATUS FOR REMOVING HIDES FROM ANIMAL CARCASSES

**Melburn W. Haws, Davis, Calif., assignor to Armour and Company, Phoenix, Ariz.**

**Continuation of Ser. No. 225,236, Feb. 10, 1972, Pat. No. 3,815,177. This application Feb. 22, 1974, Ser. No. 444,813**

**Int. Cl. A22b** *5/16*

**U.S. Cl. 17—21** **9 Claims**



1. A device for removing the hide from an animal carcass comprising conveyor means for suspending animal carcasses thereon, a stationary holder spaced from the path of said conveyor means and adapted to receive thereon a loose portion of the hide from a carcass suspended on said conveyor, a roller, and means for passing said roller downwardly against said hide between said carcass and said holder while permitting free turning movement of the roller.

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**3,895,417**

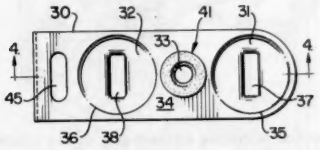
## SLIVER GUIDE

**Ernest H. Zimmermann, Jr., Webster, Mass., assignor to Brunswick Corporation, Skokie, Ill.**

**Filed Sept. 17, 1973, Ser. No. 398,012**

**Int. Cl.² D01H** *5/72*

**U.S. Cl. 19—288** **7 Claims**




1. A unitary guide for two slivers and a continuous metal filament tow comprising:

an elongated body having two trumpet shaped sliver receiving apertures spaced apart, each sliver aperture being defined by a circular entrance and a rectangular exit;

a tow receiving aperture located on the body substantially halfway between the sliver receiving apertures and having a diameter smaller than the larger dimension of the rectangular exit of the sliver apertures; and

a ceramic insert adaptably mounted in the tow receiving aperture capable of preventing excessive wear of the tow aperture by the abrasive nature of the continuous metal filament tow passing therethrough.

**3,895,418**

## END STOP MEMBER FOR SLIDING CLASP FASTENERS

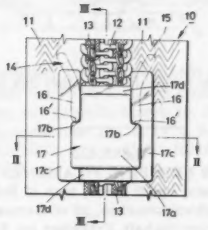
**Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed July 17, 1973, Ser. No. 379,963**

**Claims priority, application Japan, July 18, 1972, 47-85302[U]**

**Int. Cl.² A44B** *19/36*

**U.S. Cl. 24—205.11 F** **2 Claims**




1. In a sliding clasp fastener of the type which comprises a pair of oppositely disposed stringer tapes each carrying along their respective longitudinal edges a row of interlocking fastener elements made of a continuous plastic filament and a slider having side flanges and mounted on the fastener for reciprocal movement along said longitudinal edge, the improved bottom end stop member for restricting the movement of the slider which end stop member is formed of a thermoplastic material and which consists of a central body adhesively covering a plurality of interengaged fastener elements and having shoulders laterally projecting for abutting engagement with the side flange ends of the slider, further engaged fastener elements extending beyond the ends of said central body first reduced or thinned out foil portions longitudinally extending on opposite sides of said body and adhesively bonded to the respective stringer tapes, and second reduced or thinned-out foil upper and lower portions extending laterally on opposite ends of said body and downwardly stepped so as to lie below the surface of said body thereby preventing the upper portion from coming into abrasive contact with the slider, said central body being completely circumferentially surrounded by said first reduced portions and said second reduced foil upper and lower portions, and said second foil upper and lower portions being fused to said further fastener elements to form a unitary body with said end stop member and said interengaged fastener elements.

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**3,895,419**

## CROSS CHAIN HOOK

**Alfred M. Roberts, York, Pa., assignor to Campbell Chain Company, York, Pa.**

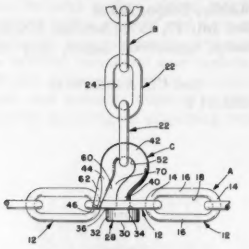
**Filed Jan. 30, 1974, Ser. No. 437,834**

**Int. Cl. A43c** *11/08;* **A44b** *13/00*

**U.S. Cl. 24—230.5 CR** **9 Claims**

1. A hook for interconnecting two links contained in two different chains comprising a head, a shank extending from said head and merging into a reversely curved bowl, said bowl merging into an end section which is spaced from said shank to define therewith a throat leading to said reversely curved bowl, said throat having a width just slightly larger than the diameter of one link whereas the bowl has a width larger than the combined diameters of the two links, whereby to assemble or disassemble the chains the two links are both positioned

about the bowl for relative movement but for operation one link is maintained about said shank and thus extends into said



throat to preclude removal of the other link positioned about said bowl.

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**3,895,420**

## PROCESS FOR CRIMPING FILAMENTS AND YARNS

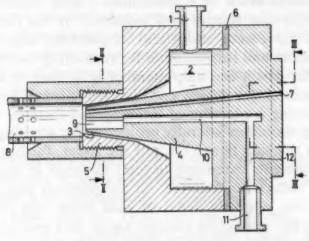
**Hans-Jürgen Strutz; Ingolf Jacob, both of Bobingen, and Johann Seelig, Schwabmunchen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Apr. 5, 1973, Ser. No. 348,226**

**Claims priority, application Germany, Apr. 10, 1972, 2217109**

**Int. Cl.[2] D02G** *1/12*

**U.S. Cl. 28—72.14** **5 Claims**



**1.** In a process for crimping filaments and yarns in which a plurality of filamentary yarns are drawn by the current of a motive fluid medium into an injector nozzle and piled up and stuffed in a perforated blowing chamber, the improvement which comprises introducing the individual filamentary yarns into the blowing chamber by separate yarn channels in the injector nozzle, and keeping them separate in the blowing chamber by introducing currents of fluid separating medium through separate fluid channels disposed inbetween the separate yarn channels while piling and stuffing the filamentary yarns in the blowing chamber.

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**3,895,421**

## METHOD OF ADJUSTING THE SENSITIVITY OF A WEIGHING MAT

**Henry F. Miller, Clifton, N.J., assignor to Uniroyal, Inc., New York, N.Y.**

**Filed Jan. 2, 1974, Ser. No. 430,370**

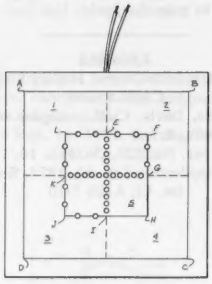
**Int. Cl. H01g** *13/00*

**U.S. Cl. 29—25.42** **7 Claims**

**1.** The method of adjusting the relative sensitivities of sections of a weighing mat comprising:

assembling at least two electrically conductive layers separated by a deformable dielectric layer to form a weighing mat with sections of different sensitivities;

measuring the sensitivities of said sections to determine the relative sensitivities of said sections;



and removing from one or more of said sections having low sensitivity at least one or more portions of said conductive and dielectric layers to bring the relative sensitivities of said low sensitivity sections of the mat within predetermined tolerance limits.

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**3,895,422**

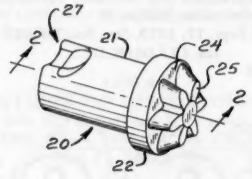
## SCREW JACK PINION GEAR AND METHOD OF MAKING SAME

**Richard S. Graafsma, Benton Harbor, Mich., and George H. Morgan, South Bend, Ind., assignors to Auto Specialties Manufacturing Co., St. Joseph, Mich.**

**Division of Ser. No. 388,391, Aug. 15, 1973, Pat. No. 3,862,577. This application July 31, 1974, Ser. No. 493,280**

**Int. Cl. B21d** *53/28*

**U.S. Cl. 29—159.2** **2 Claims**



**1.** A method of making a pinion gear or like article including the steps of first cutting a blank from an elongated supply, next transferring the blank to a first operating station, next cold forming the cut blank to a preliminary size, next transferring the blank to a second work station, next cold forming gear teeth on one end of the blank to a preliminary shape, next transferring the blank to a third work station, next cold forming the gear teeth to a final shape and simultaneously cold forming a collar on the blank end adjacent the gear teeth, next transferring the blank to a fourth work station, next cold back extruding a recess and a skirt surrounding the recess at the other end of the blank, next transferring the blank to a fifth work station and finally cold crimping the end of the recess skirt to a pre-designated shape for engagement by a pinion-gear engaging tool.

3,895,423

## MANDREL AND APPARATUS FOR MANUFACTURING MULTILAYER WINDING

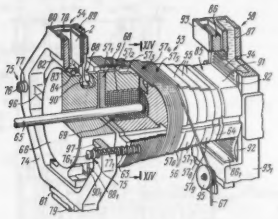
**Mikhail Alexandrovich Arakelov, ulitsa Oktyabrskaya, 303; Eduard Galaktionovich Gersamia, ulitsa Oktyabrskaya, 34, kv. 14; Tengiz Grigorievich Zedgenidze, prospekt 1, Chavchavadze 76, and Gennady Pavlovich Nozadze, ulitsa Lenina, 76, all of Tbilisi, U.S.S.R.**

**Filed Aug. 10, 1973, Ser. No. 387,282**

**Claims priority, application U.S.S.R., Aug. 11, 1972, 1818190; Aug. 11, 1972, 1818200**

**Int. Cl. H02k** *15/00*

**U.S. Cl. 29—205 D** **11 Claims**



**1.** A mandrel for the manufacture of a multi-layer winding with ferromagnetic elements placed between layers thereof; the mandrel comprising a lateral surface defined by a succession of descending steps, the number of the latter being equal to that of said layers of the winding; each of said steps having surfaces with geometric dimensions and shapes of said lateral surfaces that correspond to those of said layers, placed upon each said step with a respective one of said ferromagnetic elements; the mandrel having a configuration and strength of the magnetic field capable of reliably fixing said ferromagnetic elements on said lateral surfaces.

3,895,424

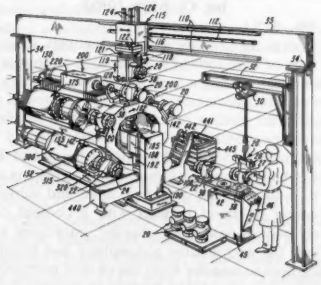
## MACHINE TOOL

**Charles F. Hautau, Oxford, Ohio, assignor to Vulcan Tool Company, Dayton, Ohio**

**Filed July 26, 1972, Ser. No. 275,267**

**Int. Cl. B23q** *39/04*

**U.S. Cl. 29—38 C** **28 Claims**



**1.** A machine tool adapted for successively machining a supply of workpieces, comprising a base frame, a turret having means forming a plurality of peripherally spaced seats on said turret, said turret having an annular portion defining a cavity, means mounted on said frame and supporting said turret for rotary indexing, a fixture member for each workpiece, means for releasably and rigidly securing each workpiece to its corresponding said fixture member, said turret including a movable clamping member for each of said seats, each said clamping member being movable between a released position and a locked position for rigidly and releasably securing the corresponding said fixture member and workpiece to said turret during indexing of said turret, a power operated actuator positioned within said cavity defined by said annular portion of said turret, means independent of said turret and supporting said actuator for movement relative to said turret, said actuator having means for releasably engaging each said clamping member and for moving each said clamping member between said released and locked positions, a series of machining units disposed around said turret and each unit being adapted to perform a predetermined machining operation on each workpiece, and means for indexing said turret to present each said fixture member and the corresponding workpiece to each of said machining units.

3,895,425

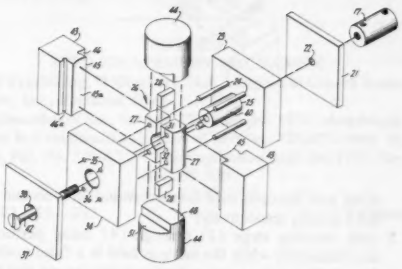
## COIL FORMING APPARATUS AND METHOD

**John Y. Pun, 10601 San Pablo Ave., El Cerrito, Calif. 94530**

**Division of Ser. No. 239,655, March 30, 1972, Pat. No. 3,786,353. This application Jan. 8, 1974, Ser. No. 431,666**

**Int. Cl. H02k** *15/04, 15/00;* **H01f** *7/06*

**U.S. Cl. 29—205 D** **5 Claims**



**1.** Apparatus for winding and initial forming of galvo-motor coils comprising a collet adapted on one end to mount on a driving shaft extending from a coil winding machine and having engageable means on the opposite end, a first pressure plate aligned with the collet and butting against the collet, a first planar coil width form of a material resisting adhesion by coil impregnation compounds aligned with the first pressure plate and abutting said plate, a center section of a frustum of a cylinder which provides the initial coil form upon which the coil is wound abutting the first coil width form and of a similar material, a second planar coil width form of a material similar to the first coil and abutting the coil winding form, locating means passing through each of the first and second planar coil width forms and the coil winding form, a second pressure plate aligned with the first pressure plate and abutting the second coil width form, shaft means extending through the first and second pressure plates and interposed center section and connected to said engaging means in the collet to thereby interconnect the first and second pressure plates, first and second coil width forms, and the coil winding form together as a unitary structure.

3,895,426

## WIRE STRIPPING METHOD AND DEVICE

**John W. Papsdorf, Lake Orion, Mich., assignor to Cardinal of Adrian, Inc., Dryden, Mich.**

**Filed Mar. 22, 1974, Ser. No. 453,787**

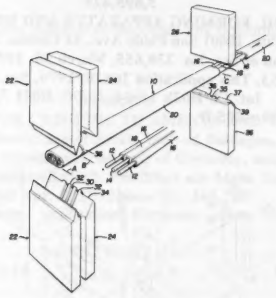
**Int. Cl.[2] B23P** *19/02*

**U.S. Cl. 29—427** **15 Claims**

**1.** A method for cutting to length and preparing for use a jacketed cable consisting of a plurality of wires arranged in parallel but spaced and planar relationship within the cable, at

least some of said wires being individually insulated prior to being encased within the jacket, comprising the steps of:

1. feeding cable to be cut into the cutting device and positioning it relative to a plurality of cutting blades to prepare the cable for cutting to a predetermined length;
2. completely severing the cable at a first point along its length;
3. severing only the jacket at secoond and third points along the cable, said second and third points being located at opposite sides of said first point and spaced a short distance therefrom;
4. severing all of the individual insulation without cutting the wires and while only partially severing the jacket at fourth and fifth points along the cable, said fourth and fifth points being located on opposite sides of said first



point and between said first point and said second and third points, respectively;

5. said severing steps (2) through (4) being performed simultaneously while the cable is held in a fixed position;
6. maintaining the cutting blades at the second and third points in an extended position at least partially penetrating the jacket to thereby prevent longitudinal movement of the severed jacket segments therebetween;
7. gripping the cable at the sides of the second and third points remote from the first point;
8. longitudinally indexing both gripped cable segments in opposite directions away from the first point while holding in place the severed jacketed segments between said first and second points and between said first and third points, to thereby loosen said jacket segments from the unsevered insulation within.

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**3,895,427**

## MACHINE TOOL WITH OVERHEAD TOOL MODULE STORAGE MAGAZINE

**Hisaji Nakao; Akira Kurosaka, both of Toyota; Katsunori Otani, Kariya; Sadaaki Tsuzuki, Kariya, and Yuzo Honda, Kariya, all of Japan, assignors to Toyoda-Koki Kabushiki Kaisha, Japan**

**Filed Mar. 29, 1974, Ser. No. 456,370**
**Claims priority, application Japan, Apr. 5, 1973, 48-38931**
**Int. Cl. B23q** *3/157*
**U.S. Cl. 29—568** **10 Claims**

1. A machine tool comprising:

a machine column;

a plurality of supporting members;

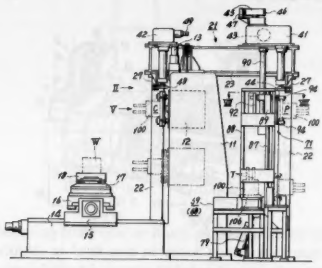
an overhead magazine body mounted on said supporting members, said overhead magazine body having a circular guide way wherein a first changing station and a second changing station are provided;

a plurality of holding means indexably mounted on said circular guide way for detachably holding a plurality of tool modules, respectively, said tool modules being changed at said first changing station and said second changing station;

a spindle head slidably mounted on said machine column so as to be moved from a lower machining position to an upper end of vertical movement thereof defining said first changing station;

means for moving said holding means along said circular guide way to index the same to said first changing station and said second changing station;

clamping means mounted on said spindle head for shifting the tool module between said holding means and said spindle head in a direction traversing said circular guide



way to thereby clamp the same on said spindle head, said clamping means permitting said tool modules to pass therethrough in the indexing operation;

a frame base;

an elevator means slidably mounted on said frame base for moving the tool module toward and away from said second changing station defined by the upper end of movement thereof; and,

shifting means mounted on said elevator means for shifting the tool module in the traverse direction to replace the same between said holding means and said elevator means, said shifting means permitting said holding means to pass therethrough in the indexing operation.

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**3,895,428**

## CONTINUOUS CASTING OF METAL RODS AND BARS

**Jean Leroy, Hoboken-Antwerp, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium**

**Filed Oct. 17, 1973, Ser. No. 407,044**
**Claims priority, application Belgium, Oct. 17, 1972, 123169**
**Int. Cl. B23k** *19/00*
**U.S. Cl. 29—527.6** **6 Claims**

1. A process for directly and continuously manufacturing profiled bars or wire rods of a metal such as copper comprising continuously casting a molten metal in a casting means in the form of a rough casting, permitting said rough casting to be cooled in the casting means sufficient to develop a solid metal envelope containing a substantial quantity of liquid metal therein, conveying said rough casting out of the casting means into the surrounding atmosphere, conveying said rough casting to a first intensive cooling zone and subjecting said rough casting to direct contact with a coolant capable of intensively cooling said rough casting, conveying said rough casting into the surrounding atmosphere and simultaneously permitting heat to transfer from the central portion thereof to the outer intensively cooled portion to thereby facilitate reheating of the cooled portion, conveying said rough casting to at least a second intensive cooling zone and subjecting said rough casting to direct contact with a coolant capable of intensively cooling said rough casting to further cool the outer portion thereof, and conveying said rough casting to the surrounding atmosphere while simultaneously permitting heat to transfer from the central portion thereof to the outer intensively cooled portion to thereby facilitate reheating of the cooled portion to thereby produce a casting having a substan-

tially uniform temperature distribution while maintaining the rate of production at such levels as to facilitate the continuous casting of such profiled bars or wire rods.

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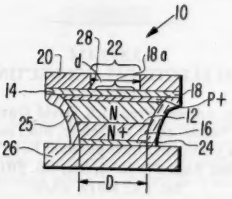
**3,895,429**

## METHOD OF MAKING A SEMICONDUCTOR DEVICE

**Ho-Chung Huang, Hightstown, and Angela San-Paolo, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed May 9, 1974, Ser. No. 468,594**
**Int. Cl. B01j** *17/00*
**U.S. Cl. 29—580** **5 Claims**




1. A method of making a semiconductor device comprising the steps of:
   a. providing a first conducting layer on one of a pair of opposed surfaces of a semiconductor wafer, then
   b. forming on said first conducting layer a second conducting layer having a plurality of spaced openings, then
   c. forming grooves in said semiconductor wafer along lines extending between said openings from the other of said surfaces of said semiconductor wafer so that each one of the remaining portions of said semiconductor wafer is disposed across one of said openings, then
   d. inserting a removable filling material into said grooves in said semiconductor wafer, then
   e. providing a substrate layer in electrical contact with a surface of each one of said remaining portions of said semiconductor wafer, and then
   f. separating said remaining portions of said semiconductor wafer.

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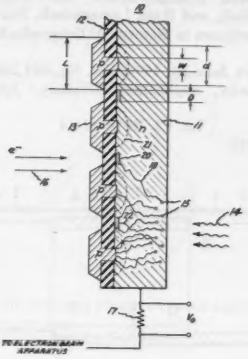
**3,895,430**

## METHOD FOR REDUCING BLOOMING IN SEMICONDUCTOR ARRAY TARGETS

**Ronald H. Wilson, Schenectady; Martin D. Gibbons, Camillus, and Samuel M. Blumenfeld, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 235,592, Mar. 17, 1972. This application Filed Sept. 20, 1973, Ser. No. 398,928**
**Int. Cl. B01j** *17/00*
**U.S. Cl. 29—584** **9 Claims**

1. A method for reducing highlight blooming in a diode array camera the target having a plurality of diodes formed on one side of a semiconductor wafer and an insulating layer overlying the semiconductor between said diodes to form a semiconductor-insulator interface comprising the step of:
   selectively irradiating the region between said diodes with electrons having an energy of approximately 10 kilovolts providing a dosage of approximately $10^{10}$ to $10^{15}$ electrons per square centimeter to establish recombination



sites at the semiconductor-insulator interface between said diodes.

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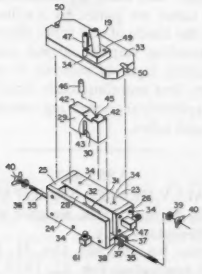
**3,895,431**

## STUD ESCAPEMENT MECHANISM

**Adolf Froehlking, Willingboro, N.J., assignor to Omark Industries, Inc., Portland, Oreg.**

**Continuation of Ser. No. 152,759, June 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 729,677, May 16, 1968, Pat. No. 3,584,727. This application Sept. 24, 1973, Ser. No. 399,938**
**Int. Cl.² B23Q** *7/00*
**U.S. Cl. 221—233** **5 Claims**



1. In stud welding apparatus, an escapement mechanism for receiving a stud from an orientation mechanism and dispatching the stud to a welding gun for welding comprising:
   a channel formed by parallel side walls and an interposed bottom wall;
   a stud transfer block having a stud receptacle therein disposed within said channel for transverse movement therealong;
   a cover plate for said channel having stud feeding and discharge ports therein in registery with said channel;
   fluid operated means interconnected with said stud transfer block for moving the transfer block alternately into and out of registry with said loading and discharge ports in the cover plate, and
   quick detachable means interconnecting said cover plate to the channel and maintaining the same in proper position whereby the cover plate can be quickly removed to replace the transfer block to accommodate studs of different lengths.

## 3,895,432

## METHOD OF ELECTRICALLY JOINING TOGETHER TWO BIMETAL TUBULAR SUPERCONDUCTORS

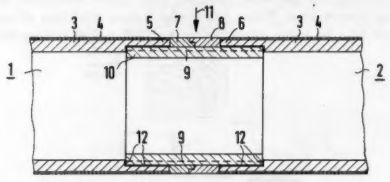
**Heinrich Diepers, Erlangen-Bruck; Karl-Heinz Jablonski, Ebermann-Stadt, and Hans Lamamatsch, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed June 20, 1974, Ser. No. 481,260**

**Claims priority, application Germany, July 4, 1973, 2334055**

**Int. Cl. H01v** *11/14*

**U.S. Cl. 29—599** **30 Claims**




1. A method for joining the end faces of two bimetal tubes made of a normally conducting metal plated with a layer of superconductive material on one of its inside and outside comprising the steps of:

a. securely attaching to each tube in a tight fitting manner an annular adapter made of the superconductive material;

b. metallurgically bonding together the adapters and the superconductive layers on each of said tubes; and

c. joining together the normally conducting metal portions of said tubes using a cylindrical connecting member of a normally conducting material;

d. wherein when said superconducting layer of material is on the outside, said normally conducting metal portions of the said tubes are joined by a cylindrical connecting member on the inside of said tubes after which said metallurgically bonding step is carried out, and when said superconductive layer of material is on the inside, said adapters are first metallurgically bonded together after which said cylindrical connecting member is joined to the outside of said tubes.

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## 3,895,433

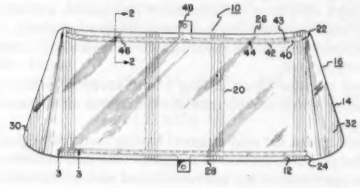
## ELECTRICALLY HEATED TRANSPARENT PANEL

**George A. Gruss, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 302,501, Oct. 31, 1972, Pat. No. 3,745,309. This application Feb. 22, 1973, Ser. No. 334,874**

**Int. Cl. H05b** *3/00*

**U.S. Cl. 29—611** **8 Claims**




1. A process of forming a composite sheet member which comprises:

a. applying a pair of segmented electrically conductive foil strips upon one major surface of a sheet of transparent thermoplastic polymer which shrinks from its original dimensions when heated to an elevated temperature so that each strip is located proximate and parallel to an opposing marginal edge of a curved safety glass window member.

b. applying a transverse pattern of resistance wires in parallel orientation with respect to one another between said segmented foil strips so that said wire pattern extends beyond the strips and securing the wire patten to the same major surface of the polymer sheet with electrical heating electrodes located at each end of the individual resistance wires.

c. supplying electrical power to the heating electrodes so that the polymer sheet and resistance wires can expand and contract during heating to embed portions of the wires in the surface of the polymer sheet, and

d. securing continuous electrically conductive foil strips of greater width and thickness than the segmented foil strips by heat-bonding said continuous foil strips to the same major surface of the polymer sheet for direct contact with the individual resistance wires and the subjacent segmented foil strips whereby portions of the segmented foil strips partially envelop said individual resistance wires.

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## 3,895,434

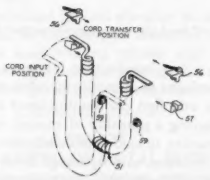
## ASSEMBLING ELECTRICAL CONNECTING DEVICE TO CORDAGE

**George Phillip Adams; Frederick David Gavin, Jr., and Anthony Pete Natale, all of Baltimore, Md., assignors to Western Electric Company, Incorporated, New York, N.Y.**

**Filed Aug. 27, 1974, Ser. No. 501,007**

**Int. Cl.[2] H01R** *43/00*

**U.S. Cl. 29—628** **15 Claims**




1. A method of assembling one dielectric part with another dielectric part about an end portion of a jacketed cord such that blade-like terminals receivable in a plurality of terminal-receiving grooves in the one part establish electrical contact with conductors in the cord, which includes the steps of:

inserting an end portion of the cord into a workholder;

moving leading ones of pluralities of the dielectric parts along separate paths into vertical alignment with each other in an assembly position;

moving the workholder to position the cord conductors thereof in essentially vertical alignment with the grooves in the one part;

exposing the portions of the conductors in alignment with the grooves while maintaining the alignment;

moving the dielectric parts into engagement with each other and with the cord such that the conductors are received within the grooves;

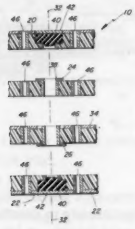
bonding together the dielectric parts at a bonding position to form a dielectric housing; and

moving terminals into the grooves while the housing is in the bonding position to seat the terminals in the housing to complete the assembly and establish electrical contact with the aligned conductors.

## 3,895,435
## METHOD FOR ELECTRICALLY INTERCONNECTING MULTILEVEL STRIPLINE CIRCUITRY

**Kenneth R. Turner, Atkinson, N.H., and James C. Bryanos, Nahant, Mass., assignors to Raytheon Company, Lexington, Mass.**

**Filed Jan. 23, 1974, Ser. No. 435,817**
**Int. Cl. H05k** *3/00*
**U.S. Cl. 29—625** **1 Claim**



1. A method for electrically interconnecting multilevel stripline circuitry, said circuitry including strip center conductors separated from a common inner ground plane and a different outer ground plane by dielectric panels, the steps comprising:

a. forming a hole through the dielectric panels, such hole passing through the common inner ground plane, strip center conductors and the outer ground planes, said inner ground plane having an aperture concentric with and larger than said hole to thereby electrically isolate said inner ground plane from said hole;

b. plating the walls of the formed hole with an electrically conductive plating material to effect an interconnection between the strip center conductors as well as the outer ground planes;

c. counterboring a portion of the electrically conductive material after the plating step to form isolation regions between the outer ground planes and the conductive material;

d. filling the isolation regions with a dielectric material;

e. depositing a conductive material over the dielectric material filling the isolation regions to form continuous outer ground planes.

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## 3,895,436
## FORMING METALS

**Leo Ewart Arthur Summers; John Fyfe Le Cornu-Rickard, and David Sidney Underhill, all of Bristol, England, assignors to British Aircraft Corporation Limited, London, England**

**Filed Jan. 15, 1973, Ser. No. 323,702**
**Claims priority, application United Kingdom, Jan. 18, 1972, 2274/72**
**Int. Cl. B23k** *3/02*
**U.S. Cl. 228—157** **9 Claims**

6. A method for producing a metal article comprising:

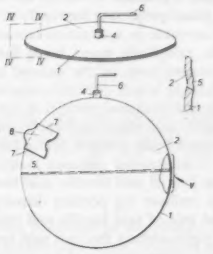
placing a pair of generally flat sheets of metallic material in contiguous face-to-face relationship with each other and in superposition so that their borders are substantially in registery;

securing the two sheets together at the borders;

opening a communication to the region enclosed by the sheets;

heating the sheets to such an extent that they behave as super-plastic material;

applying pressure through the communication to said region to inflate the region and thus deflect the sheets away from one another right to the borders thereof without disconnecting the securement at the borders; and



permitting the resulting product to cool and the pressure to return to ambient.

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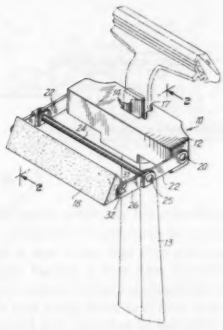
## 3,895,437
## SHAVING MOISTURIZER

**Frank M. DiBuono, 68 Merritt St., Port Chester, N.Y. 10573**

**Filed Aug. 19, 1974, Ser. No. 498,455**
**Int. Cl. B26b** *21/44*
**U.S. Cl. 30—90** **8 Claims**



1. A moisturizing device adapted to be detachably connected to a razor or the like, comprising:

1. an extended base member of substantial thickness having a clamp formed therein at one side, said clamp having an edge opening and an interior surface of irregular configuration so as to be adaptable for clamping onto a variety of razor devices;

2. an applicator pivotally connected to said base member, said applicator including

a. a first axle and a first pair of arms extending from opposite ends of said axle and pivotally connected to said base member,

b. a second axle and a second pair of arms extending from said first axle and connectable with said second axle, and

c. an applicator sponge mounted on said second axle.

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## 3,895,438
## STYROFOAM CUTTING TOOL

**Ivan H. Burkepile, and Jimmie J. Burkepile, both of Rt. 4, Box 377-DE, Fort Smith, Ark. 72901**

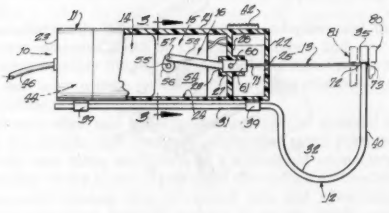
**Filed Mar. 25, 1974, Ser. No. 454,730**
**Int. Cl.[2] B23D** *49/06, 49/16*
**U.S. Cl. 30—116** **5 Claims**

1. A cutting tool intended for use in the cutting of Styrofoam-type materials, and the like, the tool comprising:

a handle member having a hollow compartment defined interiorly thereof;

a cutting means;

a blade guard member adapted to be affixed to the handle and to project a position forwardly thereof, the portion of said blade guard projecting forwardly of said handle being resiliently movable in a direction toward and away from said handle, said blade guard being formed of a unitary rod-like member bent to the desired configuration and having a straight shank portion adapted to be affixed to said handle and to extend parallel to the longitudinal axis of said handle, said shank portion terminating in one leg of a U-shaped body portion including a bight portion extending a substantial distance downwardly from the longitudinal axis of said handle, said body portion terminating in a resilient leg portion disposed normal to the longitudinal axis of said handle and projecting upwardly from said bight portion through said longitudinal axis of said handle and terminating at a position disposed on the opposite side of said longitudinal axis from said bight portion, said terminal end having a longitudinally extending slot extending partially therethrough, screw threads disposed about the circumference of said terminal end portion over the length of said slot, said guard being further characterized by an interiorly threaded cylindrically configured cap member adapted to be threadably received on said terminal end over the length of said slot, said slot being of a width adapted to receive one end of said cutting means therein with said cap being threaded onto said terminal end in a manner to assist in securing said end of said cutting means thereto;



low voltage electric motor means disposed in said handle;

transformer means disposed in said handle compartment and adapted to be connected to a conventional source of alternating current power, said transformer having an output end providing a low voltage output connected to said motor;

switch means interposed in electrical series relationship between said transformer and said motor for selectively energizing and de-energizing said motor;

a chuck disposed in said handle compartment adjacent a forward end thereof and mounted for axial longitudinal reciprocal movement; and,

drive means interconnecting said chuck to said motor for converting rotational movement of said motor into reciprocating translational motion for said chuck;

said cutting means having one end affixed to said chuck with the opposite end affixed to the terminal end of said blade guard whereby reciprocal translational motion of said chuck will effect simultaneous reciprocating movement of said cutting means.

**3,895,439**

## HAND TOOL

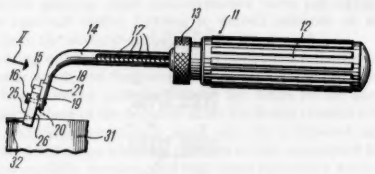
**Henry Ehrenberg, Knittlingen, Germany, and Mordechai-Gustav Hirsch, Naharlyya, Israel, assignors to Snel AG, Zug, Switzerland**

**Filed June 20, 1973, Ser. No. 371,730**

**Claims priority, application Germany, Oct. 13, 1972, 2250265**

**Int. Cl. B26b** *1/04*

**U.S. Cl. 30—171** **10 Claims**



1. A hand tool comprising in combination a handle, a blade holder secured to said handle, a blade having at least three straight peripheral surfaces defining cutting edges for surface scraping and means pivotally attaching said blade to said holder, said blade having thereon at least three peripheral notches each of which forms a substantially V-shaped cutting edge for simultaneously deburring two edges of a workpiece, said holder comprising a pair of stop surfaces engagable with one of said straight surfaces to retain said blade in position for deburring of the workpiece, and with respective ones of said straight surfaces to retain said blade in position for surface scraping of the workpiece.

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**3,895,440**

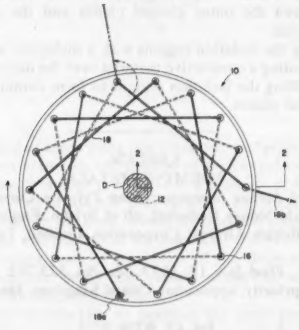
## DISK FOR FILAMENT TRIMMER

**Charles B. Pittinger, Jr., 79 Maybin Ct., Owings Mills, Md. 21117**

**Filed Oct. 15, 1974, Ser. No. 514,560**

**Int. Cl.[2] B26B** *27/00;* **A01D** *55/18*

**U.S. Cl. 30—347** **11 Claims**

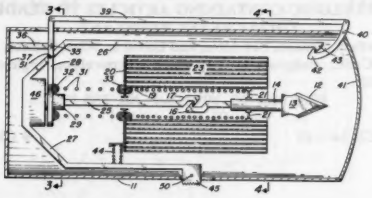


1. In a filament trimmer, a disk having means centrally thereof for attachment to a rotary drive, structure defining at least one aperture in the disk at a location proximate the perimeter thereof, a filament, means for securing a portion of the filament to the disk at a location circumferentially spaced from said aperture, and the filament passing through said aperture and extending as a cutting length therepast a distance substantially equal to the distance between said aperture and means for securing, whereby on parting of the filament at the aperture the filament will extend as a cutting length from said securing means a distance substantially equal to the distance previously extended past the aperture.

## 3,895,441
## TELESCOPIC FLICK KNIFE

Hobbs H. Horak, 1632 Tucker Rd., Oxon Hill, Md. 20022

Filed Feb. 7, 1972, Ser. No. 224,368
Int. Cl.[2] B26B *1/08*
U.S. Cl. 30—162 19 Claims

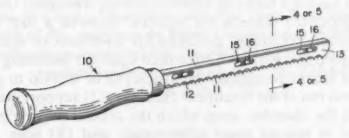


1. A hand held knife ejector which comprises:
a casing having an open end;
a power spring within said casing;
a knife blade within said casing adjacent said power spring; latching means, including a cocking fork, cooperating with said knife blade for placing and maintaining said power spring in compression;
a trigger and trigger bar operatively connected to said latching means for releasing the latching means such that the force of the power spring ejects the knife blade from the casing, the trigger bar forming a unitary member with the latching means;
a scroll spring connected to the knife blade for controlling its flight and for recapturing it for redeployment; and
a cover on the open end of the casing, the cover being connected to the latching means and cocking fork such that manual closing of the cover places the power spring in compression.

## 3,895,442
## HAND CUTTING TOOL

Orville L. Langford, 120 Lakeview, New Braunfels, Tex. 78130

Filed Dec. 21, 1973, Ser. No. 427,041
Int. Cl. B26b *5/00*
U.S. Cl. 30—299 6 Claims



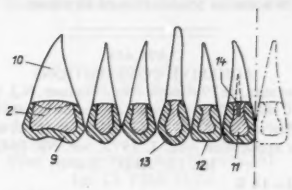
1. A hand cutting tool comprising a handle and three contiguous blades, the outer two blades being serrated support blades positioned on either side of and contiguous to a replaceable thin, flat cutting blade, said support blades having sharp cutting edges and defining a channel adapted to receive and provide transverse support for said replaceable blade.

## 3,895,443
## METHOD OF MAKING A FALSE TOOTH

Claude Pétro, 3 rue de Alper, Geneva, Switzerland, and André Glise, Le Coin, Collonges-sous-Saleve, France

Filed Nov. 20, 1972, Ser. No. 307,944
Int. Cl. A61c *13/00*
U.S. Cl. 32—8 1 Claim

1. A method of making a false tooth, comprising selecting from among a prefabricated set of different pieces of calcinable synthetic plastic material a piece having the general shape of but smaller than the false tooth to be produced, embedding the selected piece in plaster with a calcinable riser in the plaster, calcining the embedded piece and riser, casting gold

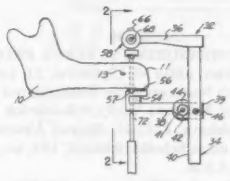


into the cavity thus produced in the plaster, thereby to produce a gold core for the false tooth, and then molding the false tooth proper about the gold core.

## 3,895,444
## MANDIBULAR STAPLE AND DRILL GUIDE

Irwin A. Small, 751 Chestnut, Birmingham, Mich. 48088

Filed Aug. 28, 1974, Ser. No. 501,318
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A 5 Claims



1. In a drill guide assembly for mandibular staples adapted for drilling a plurality of apertures in accurately located positions through a jaw bone; said drill guide assembly having an elongated post having a first arm member extending therefrom, a second arm member longitudinally movable along said post towards and away from said first arm member, means to lock said second arm member in adjusted position relative to said first arm member, said first arm member carrying a pair of spaced locator pins, said second arm member carrying a jig fixture at its outer end, said jig fixture being arcuate in a horizontal plane and having a plurality of spaced apertures extending therethrough, said apertures being located along an arcuate line, the outermost of said apertures being in vertical alignment with said pair of spaced locator pins of said first arm;
the improvement comprising spaced arcuate rows of teeth protecting outwardly from the top surface of the jig fixture in respective alignment with the arcuate inner and outer surfaces thereof;
and an arcuate grooved portion of V shape in the top surface of said jig fixture below and between said teeth;
said locator pins of said first arm member being adapted to be placed in position on the upper surface of said jaw bone at a pair of prelocated points;
said jig fixture of saidsecond arm member being adapted to cooperatively receive and center along its V groove the depending undersurface of the jaw bone and to clampingly engage the lower surface of said jaw bone upon relative adjusting movement of said second arm member towards said first arm member along said post to cause said teeth on the upper surface of said jig fixture to bitingly engage said jaw bone to prevent displacement of said drill guide when said second arm member is locked in position;

the arcuate arrangement of said plurality of apertures corresponding substantially to the curvilinear shape of said jaw bone;

and each of said apertures being adapted to guidingly receive a drill for drilling a plurality of apertures in said jaw bone at accurate predetermined locations.

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## 3,895,445
## ADHESIVE COMPOSITIONS

**Elliott Silverman, 4829 Alantic Ave., Ventnor, N.J. 08406, and Morton Cohen, 1201 Wrack Rd., Meadowbrook, Pa. 19046**

**Continuation of Ser. No. 195,857, Nov. 4, 1971, abandoned. This application Aug. 1, 1973, Ser. No. 384,484**

**Int. Cl.[2] A61C** *7/00*

**U.S. Cl. 32—14 R** **1 Claim**

1. An adhesive bond adapted to join an orthodontic bracket to a tooth comprising a layer for securement to a tooth of a set thermosetting sealing composition adjacent a layer of a hardened thermoplastic bonding composition for securement to a bracket wherein at the boundary between the two the thermoplastic bonding composition has penetrated the thermosetting sealer composition, and wherein the thermosetting sealing composition contains as major ingredients about 3 parts by weight of the reaction product of bisphenol A and glycidyl methacrylate, and 1 part by weight of methylmethacrylate and the thermoplastic bonding composition comprises a blend of polymethyl methacrylate and polycyclohexyl methacrylate in hexyl methacrylate.

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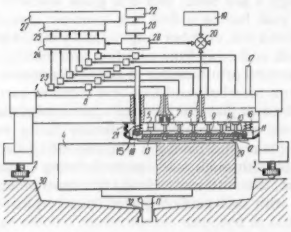
## 3,895,446
## DEVICE FOR MEASURING SURFACE PROFILES

**Petr Nikolaevich Orlov, ulitsa M. Ulyanovoi, 21, korpus 2, kv. 54; Jury Ivanovich Nesterov, ulitsa Moldagulovoi 28, korpus 4, kv. 19, both of Moscow; Vasily Yakovlevich Kudashov, ulitsa Komosomolskaya, 22E, kv. 30, and Alexandr Vasilievich Zimnyakov, ulitsa Schelkovichnaya, 184, kv. 19, both of Saratov, all of U.S.S.R.**

**Filed Dec. 3, 1973, Ser. No. 420,896**

**Int. Cl. G01b** *7/02, 7/28*

**U.S. Cl. 33—174 L** **6 Claims**



1. A device for measuring the profile of the surface of a movably mounted component both during movement thereof and while said component is stationary, comprising: a plurality of measuring elements for determining linear dimensions disposed displaced from and in alignment with predetermined points of the surface of the component to be tested; a movably mounted flexible wrapper disposed between said measuring elements and the surface of the component to be tested, said flexible wrapper having a plurality of contacting members for contacting the surface to be tested at said predetermined points at a moment of measurement, each of said contacting members being associated with one of said measuring elements; means for bringing the contacting members of said wrapper from an initial position thereof into contact with the surface to be tested at the moment of measurement so that each one of said measuring elements determines the distance at the moment of measurement from a reference plane fixed with respect to said surface to be tested to the associated one of said contacting members of said flexible wrapper.

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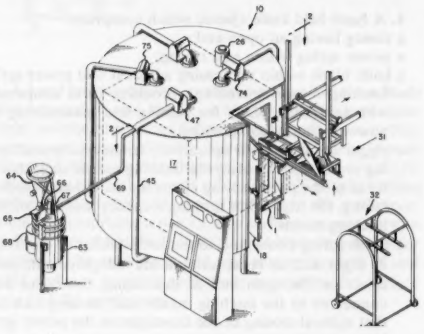
## 3,895,447
## APPARATUS FOR TREATING CELLULOSIC-CONTAINING ARTICLES TO RENDER THEM CREASE RESISTANT

**Kenneth J. Masero, Los Altos, and David L. Wise, Salinas, both of Calif., assignors to Vaportech Corporation, Inglewood, Calif.**

**Filed May 10, 1973, Ser. No. 358,993**

**Int. Cl. F26b** *19/00*

**U.S. Cl. 34—48** **9 Claims**



1. An apparatus for the treatment of articles containing cellulosic fibers in all or a part of their composition with treating chemicals in the vapor phase to render them crease resistant, comprising:

a supporting frame;

a rotatable carousel unit supported for rotation on the frame having a series of vapor-confining treatment chambers mounted thereon for rotation between a first and succeeding treatment positions for treatment of articles contained therein, each treatment chamber including (1) access means permitting the articles to be treated to pass into and out of the treatment chamber, (2) support means within the chamber upon which the articles may be positioned in spaced apart relationship, and (3) inlet and outlet ports therein permitting introduction and exhaust of an externally supplied gaseous stream;

power means operatively connected to the rotatable carousel unit to rotate the unit and each of the treatment chambers at periodic intervals between a first and succeeding treatment positions;

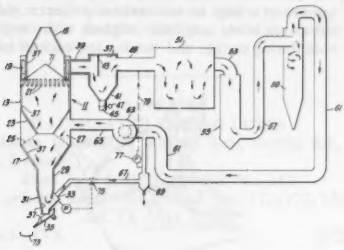
gas circulating means including gas conveying ducts at each treatment position for circulating gas through one or more of the treatment chambers at that position; and

valve means associated with each of the gas circulating means and inlet and outlet ports of each treatment chamber controlling flow of gas into and out of each treatment chamber, each valve means retracting to a non-interfering position from the inlet and outlet ports of the treatment chambers prior to rotation of the carousel unit to the next succeeding treatment position and then advancing in sealing contact with the inlet and outlet ports of each of the treating chambers in the succeeding treatment position.

## 3,895,448
## DRY COKE COOLER

**Albert G. Jonnet, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.**

**Filed Dec. 19, 1973, Ser. No. 426,248**
**Int. Cl. C10b** *39/02*
**U.S. Cl. 34—65** **2 Claims**



**1.** A vertical dry coke cooler having a cooling chamber holding hot coke in which recycle gases flow counter currently through the chamber to cool said coke, wherein the improvment comprises:

a. a coke leg at the discharge end of said cooling chamber including means to continvously discharge the cooled coke,

b. a first conduit leading from the discharge end of said coke leg for recycling gases from said discharge end,

c. a second conduit for carrying hot gases generated by the coke leading from the coke cooling chamber, said second conduit having gas cooling means,

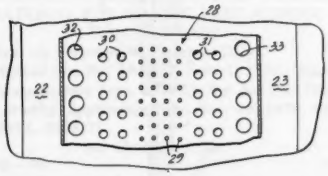
d. a third conduit joining said first a second conduits and carrying the combined discharge end recycle gases and cooling chamber recycle gases into said cooling chamber and said discharge leg, wherein a major portion of said gases is carried into the cooling chamber.

e. an automatic pressure controller in said first conduit including means operable to maintain substantially atmospheric pressure at the discharge end of said coke leg.

## 3,895,449
## AIR IMPINGEMENT SYSTEM

**James L. Chance, Rockford, and Shu Tang Han, South Beloit, both of Ill., assignors to Beloit Corporation, Beloit, Wis.**

**Continuation-in-part of Ser. No. 405,142, Oct. 10, 1973. This application Dec. 14, 1973, Ser. No. 424,644**
**Int. Cl. F26b** *13/02*
**U.S. Cl. 34—155** **5 Claims**

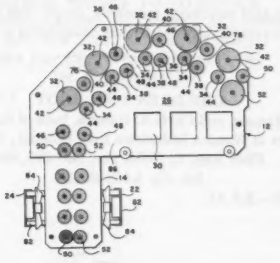


**1.** An apparatus for drying a moving web comprising a housing, an smoothly curved apertured plate closing off the housing and extending the width of said web, means for introducing pressurized air into said housing for flow through said plate, and exhaust means extending the width of said web for exhausting spent air at the edges of the plate, the apertures in said plate including small diameter holes normal to the plane of the web located centrally of said plate and larger diameter holes normal to the plane of the web located at the edges of said plate and in close proximity and parallel to said exhaust means, the smaller diameter holes being in closer proximity to the web than the larger diameter holes so that increased volume of cross flow spent air occurs at the plate edge at the location of the larger holes with higher volume air jets.

## 3,895,450
## DRYER RACK

**Henry F. Hope, 3192 Hunting Rd., Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2548 Wyandotte Rd., Willow Grove, Pa. 19090**

**Filed Apr. 4, 1974, Ser. No. 458,391**
**Int. Cl. F26b** *13/04*
**U.S. Cl. 34—155** **9 Claims**



**1.** In a rack assembly having an upstream end and a downstream end for moving a web of material, the combination of

A. a pair of side plates arranged in spaced relationship;

B. a plurality of longitudinally spaced pairs of upper and lower web driving rollers rotatively carried by the side plates,

1. said pairs of upper and lower web driving rollers being in substantially tangential contact to form a web driving nip therebetween, said pairs of web driving rollers being substantially equally spaced apart;

2. the pairs of upper and lower web driving rollers being rotated at a first rotative speed;

C. a plurality of pairs of upper and lower web guide rollers, each pair being positioned intermediate adjacent pairs of web driving rollers,

1. said upper and lower web guide rollers being spaced apart to define an open guide area of height greater than the thickness of the web,

2. said web traveling through the open guide area,

3. the pairs of web guide rollers being rotated at a second rotative speed.

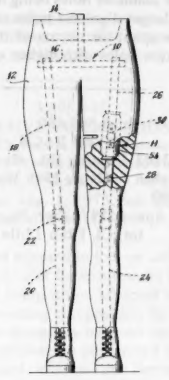
## 3,895,451
## BREAKABLE LEG

**Joseph G. Smrcka, Norwalk, Conn., assignor to Alderson Research Laboratories, Inc., Stamford, Conn.**

**Filed Oct. 9, 1973, Ser. No. 404,330**
**Int. Cl. G09b** *23/32*
**U.S. Cl. 35—17** **7 Claims**

**1.** A limb for a training dummy which comprises: first and second structural members simulating a bone in said limb; a hinge joining said structural members at a location where a

joint normally does not exist; a non-skinning foam wrapped around said hinge; and integral skin foam simulated flesh



enveloping said structural members, hinge, and non-skinning foam and having exterior contours resembling a human limb.

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**3,895,452**

**CHILDREN'S SKI BOOT**

**Alden B. Hanson, and Chris A. Hanson, both of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.**

**Filed Aug. 1, 1974, Ser. No. 493,504**

**Int. Cl. A43b** *00/00*

**U.S. Cl. 36—2.5 AL** **6 Claims**

1. A ski boot comprising a sole and a closed front semi-rigid vamp attached to said sole, said vamp having a rear opening through which a foot can be inserted;

a removable inner resilient padding liner having an inner surface contoured substantially to the surface of a wearer's foot and an outer surface contoured to fit in said outer shell;

said liner having a tongue portion spanning said rear opening in said vamp and being adapted to be pivoted through said rear opening for permitting entry of a wearer's foot to the interior of said liner; and

closure means for securing said rear opening in a closed position.

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**3,895,453**

**ACCESSORY STORAGE AND PROJECTION APPARATUS FOR VISUAL COMMUNICATIONS**

**John S. Wright, 6115 N. Lake Ct., Milwaukee, Wis. 53217**

**Continuation-in-part of Ser. No. 77,570, Oct. 2, 1970, abandoned. This application July 24, 1972, Ser. No. 274,353**

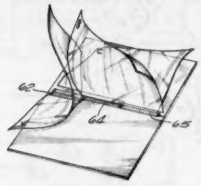
**Int. Cl. G09f** *11/08*

**U.S. Cl. 40—102** **6 Claims**

1. A book of transparencies bound together at one margin to be superimposed in a plurality of different sequences for viewing, either with an overhead projector or without projection, the combination comprising

a book binder;

a plurality of flexible transparencies, each of said transparencies being bound to said book binder along a portion of its margin adjacent the book binder, each of said transparencies having substantially the same dimensions and shape as each other transparency, said transparencies being substantially the size of a light window of a stage on an overhead projector, said transparencies being paginally aligned with one another both during storage and viewing and each of said transparencies having binding means on said margin whereby it is bound to said binder;



said binding means on said flexible transparencies consisting of one elongated rectangular tab with its width projecting perpendicular from said portion of said margin of each of said paginally aligned plurality of flexible transparencies, said tab being substantially shorter in length than the length of said margin, and said tabs being located in different positions along said margin so that no tab overlaps any other tab on said paginally aligned plurality of flexible transparencies, and said free end of each of said tabs being fastened to said binder.

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**3,895,454**

**FIREARMS FOR USE IN THE HUMANE SLAUGHTERING OF ANIMALS**

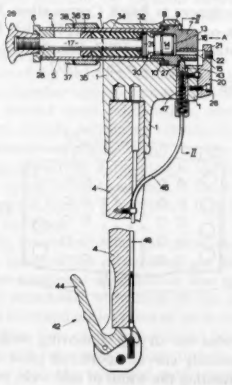
**Roger John Hancox, Burntwood, England, assignor to Accles & Shelvoke Limited, Birmingham, England**

**Filed Nov. 6, 1973, Ser. No. 413,261**

**Claims priority, application United Kingdom, Nov. 16, 1972, 52917/72**

**Int. Cl.[2] A22B** *3/02*

**U.S. Cl. 42—1 M** **17 Claims**



1. A device for use in the humane slaughter of animals comprising a body mounting a barrel and a stock, said barrel slidably locating a captive bolt, a breech block slidably

mounted within said body rearwardly of said barrel for axial movement relative to said body, a cartridge chamber for blank cartridges in said breech block extending between a forward and a rearward face of said breech block and communicating with said barrel rearwardly of said bolt, a firing pin fixed rigidly to said body opposite the rearward end of said cartridge chamber and in a first spaced relationship to said rearward face defining the non-operative position of the device, said breech block being movable rearwardly into a second spaced relationship to said rearward face in which said firing pin is closely adjacent to said rearward face defining an operative position of the device.

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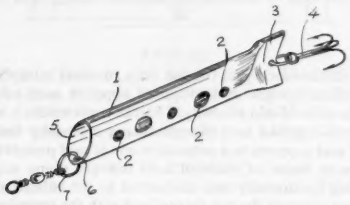
**3,895,455**

## ILLUMINATED FISHING LURES

**Charles James Johnston, 1 Killiney Ter., Breffni Rd., Sandycove, Ireland**

**Filed June 1, 1973, Ser. No. 366,242**
**Claims priority, application Ireland, Nov. 17, 1972, 1588/72**
**Int. Cl. A01k** *85/00*
**U.S. Cl. 43—17.6** **3 Claims**




1. A fishing lure comprising an apertured tubular housing for receiving a linear replaceable self-contained light source and for enabling the light source to emit light through the lure from the interior of the housing, one end of said housing being closed to simulate a fish tail, a fish hook connected to said one end, connection means at the other end of said housing for releasably retaining a linear replaceable self-contained light source in said apertured tubular housing and for connecting said fishing lure to a fishing line, said connection means comprising a ring connector which passes through an aperture in the housing, and a said light source in said housing and having a tapered extension in which there is provided an aperture, said ring connector passing also through said aperture in the said tapered extension.

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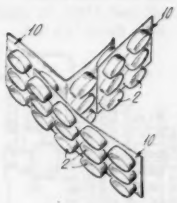
**3,895,456**

## COMPOSITION ASSEMBLY COMPRISING CONSTRUCTIONAL ELEMENTS OF PLASTIC MATERIAL FOR MAKING FREE SCHEME COMPOSITIONS

**Carlo Fabre, via Pergolesi, 6, Florence, Italy**

**Continuation of Ser. No. 194,337, Nov. 1, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 393,706**
**Claims priority, application Italy, Nov. 16, 1970, 9378/70; May 25, 1971, 9525/71**
**Int. Cl. A63h** *33/06*
**U.S. Cl. 46—30** **1 Claim**

1. A toy kit for use in forming various objects, comprising a plurality of elements of varied sizes and shapes, each element being formed integrally of a thin, elastomer sheet, a first element formed of a thin, elastomer sheet having a plurality of truncated conical depressions in the sheet, each depression forming a concavity on one side of the sheet and a convexity of the other side, each depression having a very small cone angle and having a depth that is at least one-third of the diameter of the depression, and a second element having depressions of identical shape to those of the first element, the depressions being so shaped that each is capable of forming a




shape-conforming locking relationship with any other depression and doing so at separate times.

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**3,895,457**

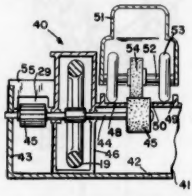
## GLOBAL SPHERE YO-YO DEVICE

**Emily Koskiewicz, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest**

**Filed July 18, 1974, Ser. No. 489,585**
**Int. Cl.[2] A63H** *1/30*
**U.S. Cl. 46—61** **5 Claims**

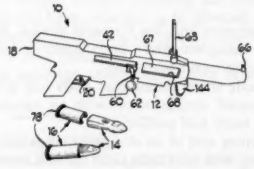
1. A spinning and Yo-Yo game device, which comprises:
a. two complementary body portions having substantially rounded outer surfaces;
b. an axle shaft joining said body half portions together in a spaced configuration with an annular grove between said body half portions;
c. an inner end of an elongated suspension cord communicating with said axle shaft and an outer end of said suspension cord adapted to receive by a hand of a Yo-Yo player; and
d. a plurality of border ribs contained on said outer rounded surfaces of said body half portions said ribs projecting in and out from said rounded surfaces, said ribs adapted to produce various degrees of air friction to produce as a means for controlling a speed of rotation of said body half portions.

3,895,458
TOY MECHANISM
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Mar. 7, 1973, Ser. No. 338,658
Int. Cl. A63h 29/20
U.S. Cl. 46—202 9 Claims



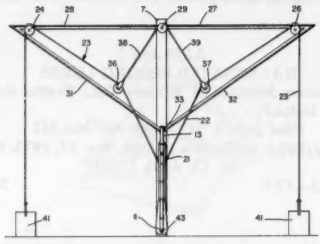
1. A vehicle toy comprising in combination:
a housing having a base for supporting said housing upright on a surface,
a rotatable assembly including a first inertia wheel rotationally supported within said housing, a portion of said rotatable assembly being exposed to the exterior of said housing and including an output driving surface which rotates with the rotation of said assembly,
a toy vehicle having a vehicle body portion and input drive means for said vehicle including a second inertia wheel supported for rotation by said vehicle body,
said second inertia wheel being operable, when inertially rotating, to drive said toy vehicle across a surface,
input drive means for said second inertia wheel,
said housing and said vehicle toy being configured to permit said vehicle to be disposed close to said housing and said output driving surface of said rotatable assembly to be coupled to said input drive means of said vehicle, and
means for power rotating said rotatable assembly within said housing to a high speed for effecting, when coupling is had between said rotatable assembly and said input drive means of said vehicle, the acceleration of said second inertia wheel to a high speed whereby, upon uncoupling of said output driving surface and said input drive means of said vehicle, said vehicle may be powered by the inertial energy of said second inertia wheel and may be driven away from said housing thereby.

3,895,459
PROPELLED TOY DEVICE AND LAUNCHER THEREFOR
Howard J. Morrison, Deerfield; Albert G. Keller, and Marvin I. Glass, both of Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Nov. 5, 1973, Ser. No. 412,695
Int. Cl.² A63H 29/00
U.S. Cl. 46—202 21 Claims



1. A toy device comprising, in combination:
a toy wheeled vehicle;
a separate shell suitable for slidably receiving the toy vehicle to form a cartridge; and
an implement for launching the toy vehicle while separating the same from and retaining the shell, and for ejecting the empty shell from the launching implement after the toy vehicle has been launched.

3,895,460
CATTLE RANCH GATE
Elmont C. Lubmann, 4643 Fruitland Rd., Marysville, Calif. 95901
Filed Aug. 16, 1974, Ser. No. 498,069
Int. Cl.² E06B 11/00
U.S. Cl. 49—131 6 Claims

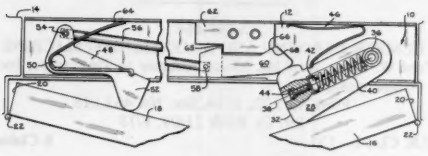


1. A cattle ranch gate for use on a roadway comprising a pair of fixed upright posts disposed opposite each other on opposite sides of said roadway, a pair of supports each including beams disposed in a triangle shape, means for fastening each of said supports to a respective one of said posts with the hypotenuse beam of each of said triangle shape supports extending horizontally and connected to the related one of said posts adjacent the top thereof and with the opposite apex of said triangle shape support secured to said related one of said posts, four sheaves, means for mounting each one of said sheaves on and adjacent to a separate end of said hypotenuse beams, a gate panel including a surrounding frame, barrier cables connected to and extending transversely of said frame, means for pivoting said frame to said posts including pivot pins arranged in alignment on a transverse axis close to said roadway, a pair of balance reevings each including a line, means for connecting the intermediate portion of said line of one of said reevings to said gate frame at one end thereof and at a point spaced well above said axis and extending therefrom upwardly over respective ones of said sheaves and then depending therefrom, means for connecting the intermediate portion of said line of said other of said reevings to said gate frame at the other end thereof and at a point spaced well above said axis and extending therefrom upwardly over the other respective ones of said sheaves and then depending therefrom, and four counter-weights each secured to an end of a respective one of said lines and resting on said roadway when said panel is upright.

3,895,461
DOOR COORDINATOR ASSEMBLY
Ralph D. Maynard, Jr., and Douglas E. Lirette, both of Ann Arbor, Mich., assignors to Door Controls Incorporated, Ann Arbor, Mich.
Filed Mar. 11, 1974, Ser. No. 449,953
Int. Cl.² E05C 7/05
U.S. Cl. 49—367 7 Claims

1. A door coordinator assembly for independently movable companion doors consisting of an active door and an inactive door each of which has a hinged edge and a free edge, said assembly comprising a fixed pivot member, a stop lever mounted on said pivot member for both pivotal and translatory movement relative to said pivot member, said stop lever being pivotally movable between protruding and recessed positions, said lever in its protruding position being engageable with said active door adjacent the hinged edge thereof to impede closing of said active door, said lever being movable

to said recessed position on closing of said active door, a trigger member movable between an operative position engageable with said inactive door to prevent closing thereof and an inoperative position in which said trigger member is out of the way of said inactive door during closing thereof, means engaged with and extending between said trigger member and



said stop lever maintaining said stop lever in said protruding position so long as said trigger member is in said operative position, and spring means extending between said stop lever and said pivot member in a position to resist said translatory movement of said stop lever, said spring means being capable of absorbing shock loads applied to said lever by said active door so as to cause translatory movement of said stop lever.

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**3,895,462**

## MICROTOME-BLADE SHARPENING MACHINE

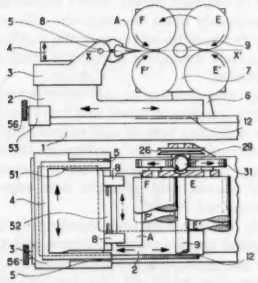
**Maurice Garin, 5 rue St. Pirest, 69200 Venissieux, France**

**Filed Mar. 20, 1973, Ser. No. 342,944**

**Claims priority, application France, Mar. 22, 1972, 72.10741**

**Int. Cl. B24b** *3/48*

**U.S. Cl. 51—85 BS** **12 Claims**



**1.** In a microtome blade grinding machine including means for moving a blade to be sharpened between an advanced sharpening position between a pair of driven grinding wheels and a retracted position away from said grinding wheels, the improvement comprising:

a. two pairs of grinding wheels mounted for rotation as a unit about a transfer axis, said grinding wheel pairs comprising roughing and finishing grinders;

b. each of said grinding wheel pairs including spaced grinding wheels mounted for rotation about parallel, coplanar axes, one of said pairs of grinding wheels normally being in working position for sharpening a blade edge;

c. means for selectively causing said grinding wheel pairs to exchange positions by rotation of said grinding wheel pairs as a unit about said transfer axis; and

d. said grinding wheel position changing means being connected to said blade moving means in such a manner that retraction motion of said blade causes simultaneous, automatic exchange of position of said grinding wheel pairs.

**3,895,463**

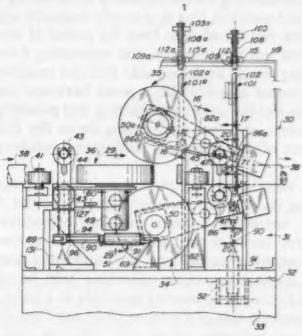
## METAL TUBE BUFFING AND POLISHING APPARATUS

**John R. Brandli, St. Charles, and Herbert Turek, Addison, both of Ill., assignors to Turek & Heller Machine, Inc., Addison, Ill.**

**Filed Sept. 17, 1973, Ser. No. 397,879**

**Int. Cl.² B24B** *5/38*

**U.S. Cl. 51—87 R** **5 Claims**



**1.** Apparatus for buffing and polishing metal tubing comprising

a. a supporting frame;

b. tube-guiding means carried by the said supporting frame for guiding metal tubing through the said apparatus in a direction generally parallel to the longitudinal axis of the said metal tubing to enable buffing and polishing operations to be performed on the peripheral surface of the said metal tubing as it is guided through the said apparatus by the said tube-guiding means;

c. two pairs of buffing and polishing wheel units each having a peripheral abrasive surface and arranged in a cluster of the same at radially spaced intervals around and relative to the longitudinal axis and the path of travel of the said metal tubing as it is guided through the said apparatus by the said tube-guiding means;

d. a first pair of said buffing and polishing wheel units being arranged in a horizontal plane and in coplanar horizontally spaced relationship relative to each other;

e. the second pair of said buffing and polishing wheel units being arranged in a vertical plane and in coplanar vertically spaced relationship relative to each other;

f. first supporting means for rotatably supporting each of the said buffing and polishing wheel units in the said first pair thereof for rotatable movement in a horizontal plane and in coplanar relationship relative to the said supporting frame and in engagement with the peripheral surface of the said metal tubing;

g. second supporting means for rotatably supporting each of the said buffing and polishing wheel units in the said second pair thereof for rotation in a vertical plane and in coplanar relationship relative to the said supporting frame and in engagement with the peripheral surface of the said metal tubing;

h. first pivotal mounting means for pivotally mounting each of said first supporting means and the said buffing and polishing wheel units carried thereby for pivotal movement in a horizontal plane toward and away from the peripheral surface of the metal tubing;

i. second pivotal mounting means for pivotally mounting each of the said second supporting means and the said buffing and polishing wheel units carried thereby for pivotal movement in a vertical plane toward and away from the peripheral surface of the metal tubing, said second pivotal mounting means including an upper pivoted assembly and a lower pivoted assembly, said upper pivoted assembly being movable about an upper pivot

axis, an upper said buffing and polishing wheel unit supported on said upper pivoted assembly and being movable therewith downwardly from a retracted position to a work-engaging position, said lower pivoted assembly being movable about a lower pivot axis, a lower said buffing and polishing wheel unit supported on said lower pivoted assembly and being movable therewith upwardly from a retracted position to a work-engaging position;

j. first motion-limiting means including an upwardly-extending first rod member, first stop means manually adjustable on the first rod member to limit the extent of movement of the first rod member into the supporting frame, first connecting means attaching said first rod member to the upper pivoted assembly at a point between the upper pivot axis and the upper said buffing and polishing wheel unit whereby the first stop means limits the downward movement of the upper said buffing and polishing wheel unit;

k. second motion-limiting means including an upwardly-extending second rod member adjacent to the first rod member, second stop means manually adjustable on the second rod member to limit the extent of movement of the second rod member into the supporting frame, and second connecting means attaching said second rod member to the lower pivoted assembly at a point located on the opposite side of the lower pivot axis from the lower buffing and polishing wheel unit, whereby said second stop means limits the upward movement of the lower said buffing and polishing wheel unit;

l. first power means carried by each of the said first supporting means and extending vertically therefrom at one side of the said buffing and polishing wheels in the said first pair thereof for rotating each of the said buffing and polishing wheel units in the said first pair thereof in a horizontal plane;

m. second power means carried by each of the said second supporting means and extending horizontally therefrom at one side of the said buffing and polishing wheel units in the said second pair thereof for rotating each of the said buffing and polishing wheel units in the said second pair thereof in a vertical plane;

n. first power transmission means for supplying power to the said first power means and to the said second power means for rotating each of the said buffing and polishing wheel units;

o. third power means for moving the said buffing and polishing wheel units in the said first pair thereof and the said supporting means and the said first power means therefor in a horizontal plane on said first pivotal mounting means into and out of a normally retracted position in which the said peripheral working surfaces of the said buffing and polishing wheel units in the said first pair thereof are disposed out of position to engage the said peripheral surface of the said metal tubing and into effective or working position in which the said peripheral abrasive surfaces of the said first pair of said buffing and polishing wheel units are positioned to engage the peripheral surface of the said metal tubing as it is guided through the said apparatus by the said tube-guiding means;

p. fourth power means for moving the said buffing and polishing wheel units in the said second pair thereof and the said second supporting means and the said second power means therefor in a vertical plane on the said second pivotal mounting means and out of a normally retracted position in which the said peripheral working surfaces of the said second pair of buffing and polishing wheel units are disposed out of position to engage the said peripheral surface of the said metal tubing and into effective or working position in which the said peripheral abrasive surface of the said buffing and polishing wheel units are positioned to engage the peripheral surface of the said metal tubing as it is guided through the said apparatus by the said tube-guiding means;

q. second power transmission means for supplying power to the said third power means and to the said fourth power means;

r. first control means for controlling the operation of the said first power transmission means; and

s. second control means for controlling the operation of the said second power transmission means.

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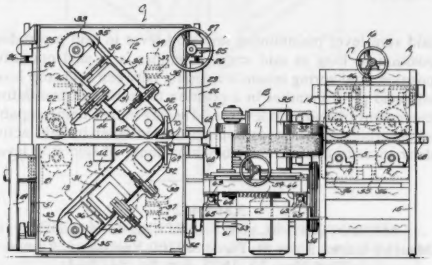
**3,895,464**

## LUMBER DRESSING AND DIMENSIONING MACHINE

**Fred W. Kiser, Hopkins, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.**

**Filed Apr. 22, 1974, Ser. No. 463,115**
**Int. Cl. B24b** *21/04, 9/18*
**U.S. Cl. 51—137** **8 Claims**



1. A machine for dressing lumber having length, width and thickness and for sizing the same to predetermined uniform width along the entire length thereof, said machine being characterized by:

A. power driven feed means to grip pieces of lumber presented to the machine and feed the same lengthwise through the machine along a straight linear path;

B. a pair of opposed power driven abrading devices to act simultaneously upon the opposite side edge surface of lumber fed lengthwise through the machine;

C. transversely extending horizontal track means fixed in the machine;

D. carriage means riding on and unrestrictedly free for back and forth translation along said track means; and

E. means mounting both of said pair of abrading devices on said carriage means for movement therewith, with the abrading devices spaced apart a distance to simultaneously abrade said opposite side edge surfaces to a predetermined depth,

whereby by virtue of said abrading devices being both mounted on the carriage means and the latter being free for back and forth translation along said track means, the width of the lumber after being thus abraded is uniform along its entire length regardless of any possible edgewise bowed or warped condition thereof.

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**3,895,465**

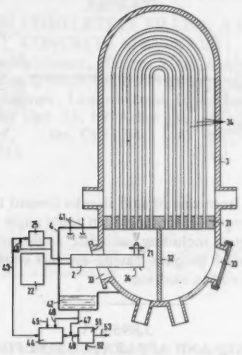
## CLEANING CONTAMINATED SURFACES OF NUCLEAR POWER PLANTS AND RECOVERY OF REMOVED SURFACE PARTICLES

**Roland Korn, Nurnberg; Günter Seyd, and Uwe Paulsen, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Dec. 3, 1973, Ser. No. 420,794**
**Claims priority, application Germany, Dec. 4, 1972, 2259334**
**Int. Cl. B24c** *1/00*
**U.S. Cl. 51—320** **7 Claims**

1. In a process for cleaning of components of nuclear reactor power plants which have been wetted during the operation with $H_2O$ or $D_2O$, particularly for the decontamination of radio-actively contaminated regions by mechanically abrading the surfaces to be cleaned down to the passivation layer of the

base material by means of boron trioxide particles with the aid of compressed gas, the improvement which comprises admixing water with the abraded solid particles and boron trioxide



particles to dissolve the boron trioxide particles, and filtering the boron trioxide aqueous solution containing abraded solid particles to separate and recover the abraded solid particles and the boron trioxide solution.

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**3,895,466**

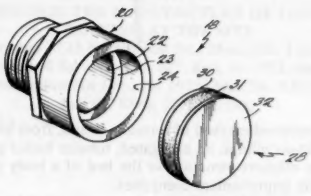
**SEWER LINE BLOW-OUT PLUG**

**Max Ray Melton, Henderson, Tenn., assignor to M. M. S., Inc., Memphis, Tenn.**

**Filed May 21, 1974, Ser. No. 472,063**

**Int. Cl. E02d** *27/00;* **F16l** *55/12*

**U.S. Cl. 52—169** **10 Claims**



**1.** A blow-out plug assembly for sealing a clean-out end of a pipe or a pipe system under normal conditions but blowing out when subjected to slight over-pressure within said pipe system, said assembly comprising

a. first and second plates for reception within the open end of a clean-out pipe and

b. A jell-like material sandwiched between said first and second plates, said jell-like material being extrudable to engage the interior surface of the pipe and hold said assembly within the pipe under normal conditions.

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**3,895,467**

**APPARATUS AND METHOD FOR FORMING FLASHINGS FOR ROOF VENT PIPES**

**Clyde H. Clement, Phoenix, Ariz., assignor to Lester E. Kron, Phoenix, Ariz.**

**Filed Nov. 21, 1973, Ser. No. 417,791**

**Int. Cl. E04h** *12/28*

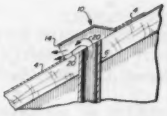
**U.S. Cl. 52—199** **7 Claims**

**1.** A nestable vented roof mounted flashing for shielding an aperture disposed in a roof to prevent the intrusion of water through the aperture, said flashing comprising in combination:

a. a protrusion for covering the aperture, said protrusion being formed of a single piece of material and including:

1. a plurality of serially joined sides for for partially circumscribing the aperture, each of said sides extending upwardly to define a vertical space, each of said sides sloping inwardly and generally toward one another to accommodate nesting of a plurality of said flashings;

2. a cover supported by and extending intermediate the upper edges of said sides for shielding the aperture;



3. a vent for providing fluid communication between the aperture and the atmosphere surrounding said flashing, said vent being defined by the space intermediate the vertical extremities of the serially joined sides; and

b. a flange formed as a unitary element of said protrusion for attaching said flashing to the roof, said flange extending laterally outwardly from the lower edge of each of said sides.

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**3,895,468**

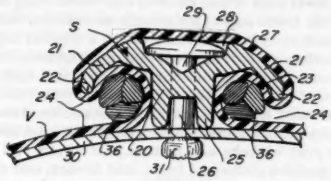
**MOUNTING STRIP FOR FLEXIBLE SHEET MATERIAL**

**Joseph D. Bernstein, 1361 S. Broadway, Denver, Colo. 80210**

**Filed Jan. 14, 1974, Ser. No. 432,875**

**Int. Cl. E04b** *1/00, 1/347*

**U.S. Cl. 52—222** **15 Claims**



**1.** An edging strip mounted upon a rigid body surface and comprising, in combination therewith:

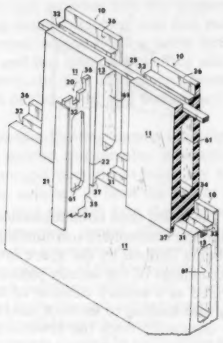
a. an elongated rigid member of uniform cross section having a central pedestal connected to and upstanding from the body surface, a lateral wing spaced above the body surface at each side of the pedestal which extends outwardly and downwardly with the extended tip of each wing being downturned toward and terminating closely to the body surface whereby to form a socket at each side of the pedestal between the strip and the body surface with a slot-like opening below the tip; and

b. a flexible sheet having a ribbon portion overlying said rigid member to cover the same, said sheet being turned downwardly at each side of the member lying against the body surface and with each side of the sheet being folded at the body surface with the fold tucked into the adjacent wing socket and wherein each wing of said rigid member arches downwardly and outwardly providing a generally arched top surface against which the flexible sheet lies.

## 3,895,469
## ROOF AND WALL PANEL SYSTEM

John R. Kapitan, 9882 W. Kentucky Dr., Lakewood, Colo. 80226

Filed July 9, 1973, Ser. No. 377,362
Int. Cl. E04c 2/20
U.S. Cl. 52—595 8 Claims



1. A structural panel system comprising a plurality of structural modules each having an upper edge, a lower edge, two opposed side edges, an inner surface, and an outer surface, the upper edge and lower edge of each module being shaped to provide a tongue and groove joint by which the lower edge of each module may be interfitted with the upper edge of the module immediately below it, and the inner surface of each module adjacent to the upper and lower edges thereof being shaped to provide a rabbeted step joint including a raised step projecting above the upper edge of the module and a recess above the lower edge of said module, said recess being shaped to receive the raised step of the module immediately below it, whereby each module may be attached to a member adjacent the inner surface of said raised step and the attachment means may be covered by the module immediately above said raised step, and a vertical joint divider between adjacent modules, said divider being shaped to match the crosssectional shape of said modules including said tongue and groove joint and rabbeted step joint whereby said vertical joint divider will interlock with modules above and below said divider, said divider having a batten joined at a right angle to the front of the divider and overlapping the edges of adjacent modules to prevent water from entering the vertical joint between said adjacent modules.

## 3,895,470
## STRUT FOR INTERCONNECTING REINFORCEMENT RODS

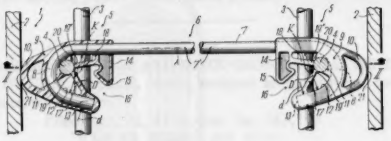
Reinhold Wurth, Schliffenstrasse, 7111 Geisbach Kries Künzelsau, Germany

Filed Feb. 25, 1974, Ser. No. 445,237
Claims priority, application Germany, Dec. 6, 1973, 2360789
Int. Cl.² E04C 5/16; B22D 5/00
U.S. Cl. 52—686 7 Claims

1. A strut for interconnecting a pair of spacedapart reinforcement rods, said strut comprising:

an elongated bar formed at each end with a hook; and

a hook-shaped body of synthetic-resin material molded on each of said hooks each of said bodies conforming to the respective hook and having a pair of shanks joined at a respective bight, said bodies being formed inside the respective hook at the respective bight with a seat adapted to receive one of said rods and offset from the center of curvature of the respective hook, and with a pair of inwardly extending deflectable tongues each

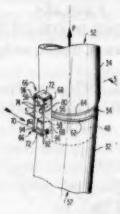


reaching from one of said shanks toward the bight, each of said tongues extending at an acute angle to said bar and said tongues including an acute angle with each other, each of said tongues having an end snugly engageable against a rod in said seat.

## 3,895,471
## METHOD AND APPARATUS FOR FORMING ELONGATED BATTER PILING IN SITU

Alfred Reeves Kolb, Garalston on Sea, England, assignor to Brown & Root, Inc., Houston, Tex.

Filed Apr. 9, 1974, Ser. No. 459,340
Int. Cl.² E02D 5/28
U.S. Cl. 52—726 17 Claims



1. An improved method of forming, in situ, from successive tubular add-on pilings, an elongated, tubular batter piling for pinning an offshore structure to the bed of a body of water, wherein the improvement comprises:

suspending an add-on piling in a position of at least partial abutting contact with an upwardly projecting free end of a previously placed length of batter piling; exerting a longitudinal clamping force at the location of the at least partial abutting contact between said add-on piling and the previously placed length of batter piling, to maintain and stabilize the position of the add-on piling relative to the previously placed length of batter piling, said clamping force being exerted by

forcing opposed, protruding ear members carried by said add-on piling and said free end of said batter piling into positions of mutually greater proximity by means of a deformable wedging member disposed in force transmitting cooperation with said ear members and operable to transmit divergence preventing force thereto, at least one of said ear members being connected to said add-on piling adjacent the location of said at least partial abutting contact between the add-on and the previously placed length of batter piling and at least another of said ear members being connected to said free end of said batter piling adjacent said at least partial abutting control; and

selectively relaxing said clamping force by deforming said wedging member to permit said ear members to diverge and the force of gravity to gradually pivot said add-on piling about the location of the at least partial abutting

contact to a posture of axial alignment with said free end of said batter piling.

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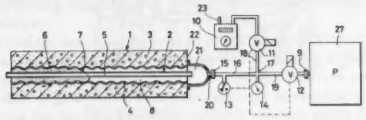
**3,895,472**

## METHOD FOR COMPLETELY FILLING A CAVITY IN A CONCRETE STRUCTURE

**Ernst Wilhelm Steinhauer, Halver; Klaus Fischer, and Oskar Lower, both of Wetzlar, all of Germany, assignors to Ernst Wilhelm Steinhauer, Langenscheid, Germany**

**Filed Nov. 15, 1973, Ser. No. 416,289**
**Int. Cl.[2] E04C** *1/40*
**U.S. Cl. 52—743** **3 Claims**



1. Method for completely filling of a cavity in a concrete structure with a filling compound, wherein prior to introducing the filling compound the cavity is evacuated, comprising the following method steps:

a. withdrawing air from the cavity to a preselected pressure,
b. introducing gas, into the cavity and measuring the volume of the in-flowing gas,
c. determining the volume of the cavity from the amount of gas which entered during the method step b),
d. withdrawing the gas contained in the cavity up to a small residual pressure,
e. introducing the filling compound into the cavity and measuring the volume of the entering filling compound.

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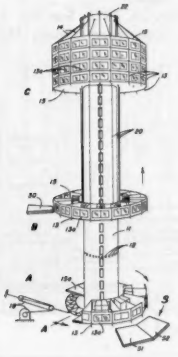
**3,895,473**

## PROCESS FOR THE MANUFACTURE OF LOW COST HOUSING AT THE SITE

**R. Lee Fraser, 3723 Northwood Dr., Memphis, Tenn. 38111**

**Continuation of Ser. No. 223,127, Feb. 4, 1972, abandoned. This application Dec. 28, 1973, Ser. No. 429,047**
**Int. Cl. E04g** *21/14, 23/00*
**U.S. Cl. 52—745** **9 Claims**



1. In a process for manufacturing housing of the type in which surrounding floors are positioned on a core from top to bottom and a fixed work area including one or more work stations is spaced radially outwardly from said core, the improvement comprising the steps of:

a. assembling from said work area a unitary washer type floor in concentric relationship to said core by constructing portions of said floor from said work area and horizontally rotating the constructed portions of said floor around said core to bring unconstructed areas of said floor adjacent said work area for construction of further portions of said floor; and
b. continuing the rotation and construction until said washer type floor extends in a complete 360° relationship concentrically around said core.

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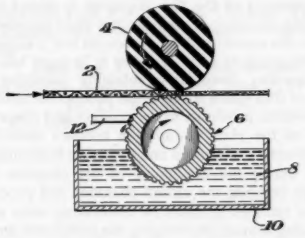
**3,895,474**

## PROCESS FOR PREPARING PRE-MOISTENED ANTIMICROBIAL TOWELS

**Stuart M. Bauer, Succasunna, N.J., assignor to Pfizer Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 305,859, Nov. 13, 1972. This application Nov. 16, 1973, Ser. No. 416,484The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.**
**Int. Cl.[2] B65B** *63/04*
**U.S. Cl. 53—21 FC** **6 Claims**



1. A process for preparing pre-moistened antimicrobial towels which comprises the steps of coating paper or fabric sheet in strip form with a solution of antimicrobial agent in a volatile vehicle; permitting at least a portion of said vehicle to evaporate; longitudinally folding said coated sheet; transversely perforating said coated sheet into separable towel segments; transversely folding said perforated sheet; arranging said folded and perforated sheet in stack form in a moisture-impervious container; moistening said stack with aqueous liquid; and enclosing said moistened stack with a moisture-impervious cover seal on said container.

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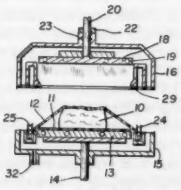
**3,895,475**

## METHOD AND APPARATUS FOR VACUUM SKIN PACKAGING OF SOFT MEAT AND THE LIKE

**Robert O. Wolfelsperger, Fairfield, N.J., assignor to William E. Young, Atlantic Highlands, N.J.**

**Filed Apr. 18, 1974, Ser. No. 462,035**
**Int. Cl.[2] B65B** *31/02*
**U.S. Cl. 53—22 A** **6 Claims**



4. Method for vacuum skin packaging of a product such as soft meat, a low profile product, a product of dissimilar por-

tions and the like, the packing steps requiring the product portion to be brought under the influence of vacuum for at least a short period of time to achieve a condition of reduced pressure, this method including the steps of: (a) providing a chamber having upper and lower halves with the lower half having a platen on which there is formed an upper surface means for supporting a product; (b) delivering and positioning on this lower platen support surface a lower film and subsequent to positioning the lower film placing the reon a product; (c) providing on the upper chamber half a lower sealing means compatible with an upper surface of the lower chamber and when the upper chamber is brought to a seating condition with and on the lower chamber half establishing a substantially vacuum-tight chamber; (d) transporting and positioning an upper film web by means adapted to drape this upper film web over the product and in and after so draping bringing the outer portions of the web into a retained condition on the lower chamber half and establishing therewith a communication pathway between the draped upper film web and the lower film, this pathway insuring that the product is subject to the same environmental condition as that provided in the interior of the sealed chamber; (e) forming and providing an upper film transport having enclosing means so formed and positioned that during the period of closing the upper and lower chambers portions of the film transport is sealed from the interior of the chamber; (f) moving this plate member so that as and when the upper chamber is brought into a seated condition, the intermediate plate member is brought into a fixed position providing therewith a retaining condition of that upper web of film which is above the product to maintain this film in immediate proximity to the product and absent further movement of the plate toward the product therewith and thereby preventing unwanted and excessive ballooning of the upper film during the evacuating of the chamber and the product; (g) bringing the closed chamber and product to a condition of reduced pressure by connecting same to a vacuum producing source; (h) bringing the peripheral portions of the upper and lower films to a condition for sealing to each other; (i) closing the communication pathway between the upper and lower films and to the product, and (j) shutting off the source of vacuum to the chamber and opening the interior of the evacuated chamber to atmosphere, pressurized gas and the like and with the resulting pressure differential one the exterior of the upper film pressing the peripheral portions of the upper and lower films into a sealed condition and thereafter opening the chamber and removing the packaged product.

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**3,895,476**

## SHRINK-FILM PACKAGING METHOD

**Henry Knox Burns, III, 1830 Redwood Dr., Macon, Ga. 31201**

**Division of Ser. No. 303,762, Nov. 6, 1972. This application Oct. 18, 1973, Ser. No. 407,607**

**Int. Cl. B65b** *53/02, 35/50*

**U.S. Cl. 53—26** **8 Claims**

1. An improved method of heat-shrink-wrap packaging masonary brick articles into a rigid, generally cube-shaped unitary package wherein said brick articles have substantial 3-dimensional size, are of parallelpiped prismatic form and have a pair of major planar opposed surfaces for stacking said bricks and have inherent tolerance variations which contribute collectively to the unstable stacking of bricks in substantial height, superimposed layer-relation when uniformly oriented, said method of brick packaging comprising the steps of:

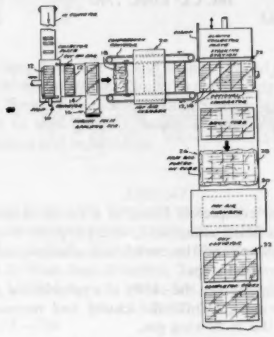
a. initially forming a plurality of uniform sized smaller sub-packages of multiple unit brick articles by

1. aligning a predetermined number of the bricks in generally coplanar and contiguously aligned form,

2. providing and applying a heat-shrinkable film to said aligned bricks, and

3. applying heat to shrink the film around said aligned bricks so as to compactly maintain them as a collectively wrapped sub-unit or sub-package;

b. accumulating a predetermined number of said heat-shrunk-wrapped sub-packages and assembling them in coplanar form closely adjacent to one another to constitute a given tier or layer of the sub-packages, then stacking plural numbers of said sub-packages into a plurality of superposed layers or tiers with the bricks of each layer substantially vertically aligned with those of the layer below; and then



c. subsequently wrapping said plural tiers or layers of said heat-shrunk-wrapped sub-packages in an outer heat shrink film to substantially envelope the aligned assembly of sub-packages; and

d. subjecting said latter wrapped assembly to heat and then allowing it to cool to effect heat shrink fitting of said outer wrapped film to compactly embrace and stabilize the wrapped bricks into a completed package ready for storage and shipment.

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**3,895,477**

## APPARATUS FOR ADVANCING AND POSITIONING ARTICLES

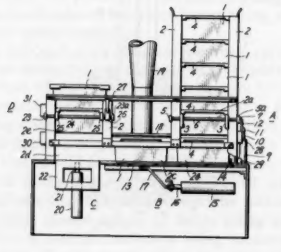
**Kameshiro Yamashita, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan**

**Filed Mar. 21, 1973, Ser. No. 343,499**

**Claims priority, application Japan, Mar. 21, 1972, 47-27447**

**Int. Cl. B65b** *57/20*

**U.S. Cl. 53—59 R** **4 Claims**



1. Apparatus for advancing articles along a path and selectively positioning the articles at various positions along the path comprising:

first means receptive of a plurality of articles during use of the apparatus for successively positioning the articles in

an initial starting position, said first means comprising means defining a vertical guideway aligned with said initial starting position and receiving therein during use of the apparatus a vertical stack of articles for guiding the articles vertically downward, a set of claws disposed around the periphery of said guideway and jointly engageable with an article in said guideway to support said article as well as all the remaining articles stacked thereupon, means mounting said sete of claws for pivotal movement together in synchronism to disengage from said article and engage the article stacked thereon thereby allowing the disengaged article to drop along said guidway into said initial starting position, and means for effecting synchronous pivotal movement of said set of claws;

second means coacting with said first means for successively advancing the articles one-by-one from said initial starting position along a path to a working position and then after a given time delay successively advancing the articles one-by-one from said working position along the path to another position, said second means comprising extendable and collapsible engaging means for releasably engaging with an article located in said initial position, means mounting said engaging means for movement along said path from said initial starting position to said working position, and actuating means for intermittently extending and collapsing said engaging means to effect successive advancement of the articles from said initial starting position to said working position and to push each article located in said working position into said other position by a succedding article being advanced into said working position; and

third means for successively advancing the articles from said other position to a final position.

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**3,895,478**

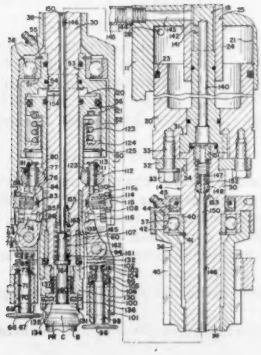
## ROLL ON CAPPING HEAD

**Kenneth F. M. Friendship, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.**

**Continuation of Ser. No. 161,235, July 9, 1971, abandoned. This application Oct. 19, 1972, Ser. No. 301,001**

**Int. Cl. B67b** *3/18, 3/26;* **B65b** *57/02*

**U.S. Cl. 53—77** **34 Claims**



5. A sealing head for securing a container closure member on the mouth of a container which closure member is characterized by a top panel and a depending skirt, said sealing head comprising:

a support member;

a spindle assembly mounted on said support member for vertical reciprocation relative to a work station and having engaging means on the bottom end thereof engageable with the closure member when the spindle assembly is lowered;

shaping means carried by said spindle to cause the skirt to conform to the surface of the container;

piston actuated cam means adapted to be connected to a source of fluid energy for actuating said shaping means;

valve means carried by said spindle for admitting fluid energy against said piston cam means when a closure is present in said container, said camming comprises a cylinder and piston, said piston having a cam surface thereon for actuating said shaping means, and said shaping means comprises skirt engaging rolls mounted on pivot arms for engagement with the skirt of the closure.

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**3,895,479**

## APPARATUS FOR PACKAGING CIGARETTE TUBES

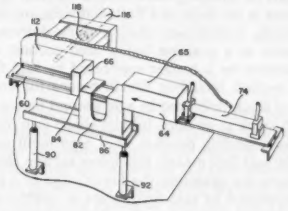
**Arnold Kastner, 10220 Armand Lavergne, Montreal, Quebec, Canada**

**Filed Aug. 2, 1974, Ser. No. 494,285**

**Claims priority, application Canada, Nov. 16, 1973, 185977**

**Int. Cl.[2] B65B** *19/34, 19/20*

**U.S. Cl. 53—148** **10 Claims**

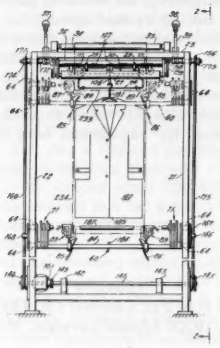


1. Apparatus for packaging cigarette tubes and like articles including a box-filling assembly comprising a supply hopper for cigarette tubes having an open lower end and a transfer member mounted for horizontal reciprocal movement beneath the hopper to tube restraining and tube receiving positions, the transfer member having a retention surface for holding tubes within the hopper when in tube restraining position and a tube receiving recess for selectively receiving a quantity of tubes when in tube receiving position, and a support plate mounted within the recess and selectively vertically reciprocally movable from a lowered position to tube supporting position, the support plate being mounted for horizontal reciprocal movement with said transfer member, the tube receiving recess receiving a quantity of tubes from the hopper when the transfer member is in tube receiving position and the support plate is in lowered position, and a displacement plate mounted for horizontal reciprocal movement normal to the horizontal reciprocal movement of the transfer member for selectively displacing a quantity of cigarette tubes from the tube receiving recess into an open front or top of a box.

## 3,895,480
## AUTOMATIC BAGGING APPARATUS

Anthony Lombardo, 29 Bailey Ave., Bayshore, N.Y. 11706

Filed Aug. 13, 1973, Ser. No. 387,603
Int. Cl. B65b *5/02, 43/00*
U.S. Cl. 53—256 13 Claims



12. Apparatus for bagging a hanger held garment; said apparatus including an upper relatively stationary section; a lower section below said upper section; means mounting said lower section for generally vertical movement toward and away from said upper section; said upper section including first means for supporting a hanger having a garment thereon, second means for drawing thermoplastic tubular stock from a supply thereof in the form of a flattened web, and third means for transversely cutting and sealing stock delivered by said second means at a position below said second means and above a garment on a hanger supported by said first means; said lower section including fourth means for engaging the lower end of stock delivered by said second means and maintaining such stock in an open tubular shape as it moves downward in a surrounding position over a garment on a hanger supported by said first means; said lower section also including seventh means for detecting the lower edge of a garment on a hanger supported by said first means to control stopping of said lower section during downward travel thereof.

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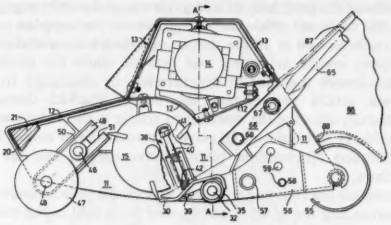
## 3,895,481
## LAWN MOWERS

Norman Seth Olney, and Timothy Dickinson, both of Stowmarket, England, assignors to Suffolk Lawn Mowers Limited, Suffolk, England

Filed Dec. 6, 1973, Ser. No. 422,351
Claims priority, application United Kingdom, Dec. 11, 1972, 57000/72
Int. Cl. A01d *55/20*
U.S. Cl. 56—17.5 9 Claims

1. A lawn mower comprising a structural frame and an operating handle, said structural frame including a pair of spaced apart side plates formed of electrically insulating plastics material and a plurality of structural metal components extending transverse to said side plates, securing means securing each said metal component to each said side plate at a point spaced apart from the securing points of other of said structural metal components, further securing means securing said operating handle to each said side plate at a point spaced from said metal components securing points, a metal cutting cylinder, bearing means secured to said side plates and rotatably mounting said cutting cylinder, a metal bottom blade in cutting relationship with said cutting cylinder, means mounting said bottom blade to said side plates, and said cutting cylinder and said bottom blade being spaced apart from said handle and from said structural metal components, whereby said structural metal components and said handle are all electrically isolated from one another, and whereby said cylinder and said bottom blade are electrically isolated from said structural metal components and from said handle.



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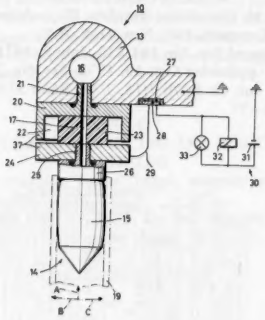
## 3,895,482
## BOBBIN CHANGING APPARATUS

Günter Schulz, and Wolfgang Igel, both of Ebersbach, Germany, assignors to Zinser-Textilmaschinen GmbH, Ebersbach, Germany

Filed June 27, 1973, Ser. No. 374,136
Claims priority, application Germany, June 27, 1972, 2231377
Int. Cl. D01h *9/04*
U.S. Cl. 57—52 24 Claims



1. An automatic bobbin changing apparatus for a textile machine, the apparatus being particularly useful in conjunction with spinning machines, twisting machines, winding machines and the like comprising, in combination:

a. at least one bobbin gripper for gripping and holding a bobbin;

b. at least one carrier on which said bobbin gripper is disposed;

c. controllable means for effecting movement of said bobbin gripper;

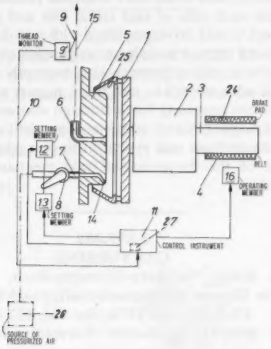
d. sensing means responsive to the impeding of said bobbin gripper in its predetermined path for developing a control signal, said sensing means including a contact member disposed on said bobbin gripper, which contact member is movable against a biasing force relative to said bobbin gripper; and

e. means responsive to the control signal for controlling said means for effecting movement of said bobbin gripper.

## 3,895,483
## APPARATUS FOR CLEANING SPINNING ROTORS

Gerhard Grau, Albershausen, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Germany

Filed May 28, 1974, Ser. No. 474,050
Claims priority, application Germany, May 28, 1973, 2327127
Int. Cl. D01h 1/12
U.S. Cl. 57—56 5 Claims

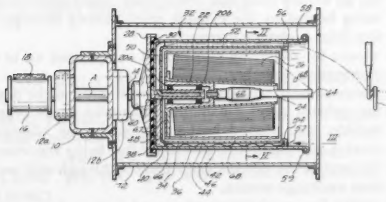



1. In an apparatus for removing of deposits from at least one spinning rotor on an open end spinning frame, the apparatus including a respective pneumatic cleaning instrumentality operatively associated with each spinning rotor for freeing fibers and other foreign bodies, if any, not spun into thread from the respective rotor, and a thread monitor provided for initiating a continuous reduction of the rpm of the spinning rotor in case of thread breakage, the improvement comprising a timing device responsive to output from said thread monitor indicative of thread breakage for controlling the cleaning instrumentality to effect the start of cleaning after a predetermined lapse of time from the instant of thread breakage as signaled by said monitor, said timing device also effecting the termination of the cleaning operation upon the lapse of an additional period of time.

## 3,895,484
## SPINNING APPARATUS

Aloys Greive, Munster/Westphalia, and Theodor Tiemann, Bosensell/Munster, both of Germany, assignors to Hamel GmbH Zwirnmaschinen, Munster/Westphalia, Germany

Filed Apr. 11, 1973, Ser. No. 349,990
Claims priority, application Germany, Apr. 11, 1972, 2217369
Int. Cl. D01h 7/86
U.S. Cl. 57—58.74 15 Claims

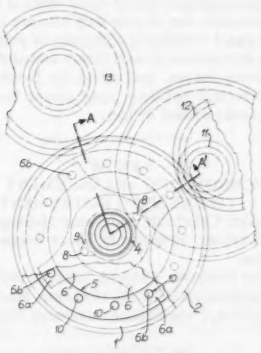


1. A thread-spinning apparatus comprising:
a spindle lying along and rotatable about a generally horizontal axis;
a flyer having a base attached to said spindle and a sleeve extending axially from said base, said spindle and said flyer being formed with a passage opening axially at one end away from said base at said axis and opening axially at the other end away from said base at a location offset from said axis;
a thread support carried on and rotatable relative to said spindle, said support being provided with an eccentric weight, whereby said weight prevents said support from rotating

## 3,895,485
## TIMEPIECE CLICK DEVICE

Jean-Pierre Gerber, La Chaux-de-Fonds, and Rudolf Feller, Le Locle, both of Switzerland, assignors to Zenith Time S.A., Switzerland

Filed Feb. 14, 1974, Ser. No. 442,343
Claims priority, application Switzerland, Mar. 6, 1973, 3245/73
Int. Cl. G04b 19/24, 19/22, 9/00
U.S. Cl. 58—4 R 8 Claims



1. In a timepiece comprising a click device between a first hour wheel and a second wheel carrying an hour indicator, the improvement wherein the first hour wheel is mounted freely on a shoulder of the second wheel, the first wheel being maintained on the shoulder by a leaf spring secured to the second wheel, and said spring having at least one arm extending to a free end and provided towards said free end with means cooperating with complementary means carried by said first wheel for holding said first and second wheels in any one of a plurality of discrete relative angular positions.

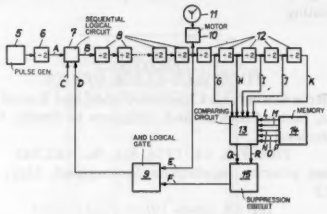
## 3,895,486
## TIMEKEEPER

Walter Hammer, Boudry, NE; Eric Andre Vittoz, Cernier, NE; Jean Hermann, Neuchatel, NE, and Hubert Choffat, Saint-Blaise, NE, all of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Mar. 21, 1972, Ser. No. 236,774
Claims priority, application Switzerland, Oct. 15, 1971, 15117/71
Int. Cl. G04b 27/00
U.S. Cl. 58—23 R 21 Claims

1. A self-adjusting timekeeping apparatus comprising: a resonator producing a pulsed output signal having a non-adjusted frequency; a frequency divider coupled to said resonator for dividing the frequency of the output singal of said resonator, said frequency divider including auxiliary input means for adjusting the frequency division ratio thereof; memory means for storing coded data in the form of a plurality of binary data bits; and frequency adjusting means coupling said memory means to said auxiliary input means for adjusting the

frequency division ratio of said frequency divider as a function of the coded data stored in said memory means to thereby adjust the output frequency of said frequency divider, said frequency adjusting means including means for comparing the binary coded data bits stored in said memory means with a corresponding plurality of data bits produced at intermediate outputs of said divider, means coupled to said comparing




means for generating an output signal when at least one set of compared memory and divider data bits are in coincidence, said output signal comprising a plurality of pulses the number of which is determined by said binary coded data bits stored in said memory means, and means for feeding said output signal back to said auxiliary input means for adjusting the output frequency of said divider.

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**3,895,487**

## SYNCHRONIZING ARRANGEMENT FOR A TIMEKEEPING INSTRUMENT

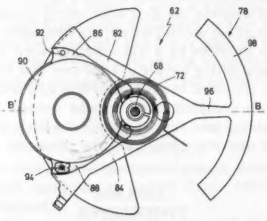
**Manfred Barth, Calmbach, and Heinz Meitinger, Mutlangen, both of Germany, assignors to Timex Corporation, Waterbury, Conn.**

**Continuation of Ser. No. 265,102, June 21, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,797**

**Claims priority, application Germany, Jan. 13, 1972, 2201557**

**Int. Cl.[2] G04C *3/04***

**U.S. Cl. 58—28 B** **10 Claims**




**1.** A synchronizing arrangement for a time-keeping instrument including an electromechanical actuating device for driving the instrument having a control system which includes at least one driving coil movable in relation to a fixed permanent magnet system by means of which control system a driving coil carried on a mechanical oscillating member rotatable about a axis can be set into motion on either side of a zero point of oscillation predetermined central between two opposite extreme positions of oscillation of said driving coil and substantially at which point a drive impulse is coupled to said driving coil with constant synchronizing frequency through a selected synchronizing amplitude, said oscillation being opposed by a spring member coupled to said oscillating member exerting a substantially constant counterforce in such manner that with said driving coil being disposed at said synchronizing amplitude said oscillating member then having zero oscillating velocity and

a pulse generator for generating electrical control pulses coupled to means for dividing down the frequency of the control pulses and feeding said pulses to the coil of said control system wherein the improvement comprises:

at least two separate ferromagnetic adjunctive elements each being mounted in a fixed geometric relation on said oscillating member in such manner that with said driving coil being disposed symmetrical with respect to a radial line passing through said axis and the center of said driving coil and said zero point of oscillation said adjunctive elements each being then disposed remote nd symmetrical on each side of said radial line and peripheral with respect to said driving coil and with said driving coil being disposed approximately at said selected synchronizing amplitude said adjunctive elements only then being disposed with respect to said fixed magnet system to generate a synchronizing force through cooperation with said fixed magnet system which is dependent upon amplitude variations from said synchronizing amplitude for adjustment of the frequency of said mechanical oscillating member.

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**3,895,488**

## GAS TURBINE

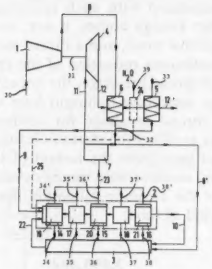
**Christian Koch, Nurnberg-Grossgrundlach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Jan. 10, 1974, Ser. No. 432,422**

**Claims priority, application Germany, Jan. 25, 1973, 2303586**

**Int. Cl. F02c *3/20*, *7/08***

**U.S. Cl. 60—39.46** **5 Claims**



**1.** In combination with a gas turbine having a compressor, a combustion chamber, a gas converter and a decompression turbine for complete and uniform combustion of the liquid fuel supplied thereto, the improvement which comprises:

a. a first heat exchange means positioned in the path of the exhaust gases emanating from said decompression turbine, said first heat exchange means adapted to receive the air exiting from said compressor, said compressed air being heated by the exhaust gases passing through said first heat exchange means;

b. means for supplying said heated compressed air to said combustion chamber;

c. a second heat exchange means positioned in the path of the exhaust gases emanating from said decompression turbine, said second heat exchange means adapted to receive said liquid fuel, said liquid fuel being vaporized by the heat of the exhaust gases passing through said second heat exchange means;

d. means for connecting said second heat exchange means to said gas converter for supplying said vaporized liquid fuel to said gas converter; and

e. a gas converter comprising:

1. a plurality of reaction chambers;

2. heat exchange means in working relationship with each of said reaction chambers;
3. heat exchange means interposed between said reaction chambers; and
4. means for conducting a portion of the exhaust gases from said combustion chamber to each of said heat exchange mechanisms in said gas converter, whereby the heat of said exhaust gases given off in the gas converter heat exchange means facilitates the gas conversion process.

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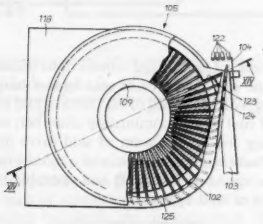
**3,895,489**

## APPARATUS FOR PRODUCING A KNITTED FABRIC WITH PROJECTING BARBS

**Norbert Waller, Landhausweg 51, 7031 Weil Im Schonbuch, Germany**

**Division of Ser. No. 159,036, July 7, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 394,180**
**Int. Cl. D04b** *35/00*
**U.S. Cl. 66—91** **1 Claim**




1. In a warp knitting machine for producing a one-face fabric having a base fabric and relatively long-drawn plush loops of monofilament threads of a thermoplastic material knitted into said base fabric and projecting substantially vertically therefrom and being set by a heat treatment and fixed in said vertical position by being dressed with a sizing material, wherein each of said loops is then opened at one laterial side so as to form a barb with a narrow head, an improved construction comprising means rotatably mounted in the knitting machine about an axis for holding each of said loops for a sufficient length of time for being set by said heat treatment before it is fixed and cut open to form said barb, a single needle bar operatively mounted in said knitting machine, said loop-holding means comprise a plurality of setting hooks which form endless rows around said axis, each of said rows being disposed within the space between adjacent needles of said needle bar, said loops are formed by winding said monofilament thread around said setting hooks, and means for moving said setting hooks of each row along a predetermined path in a manner so that said hooks are moved together with said loops during the formation of several courses and so that the distance between the adjacent hooks of each row is gradually increased during said movement.

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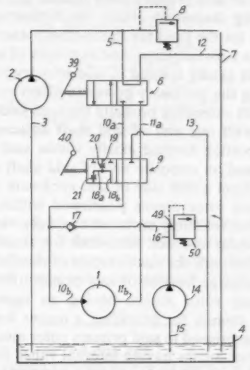
**3,895,490**

## CONTROL CIRCUIT FOR A PRESSURIZED FLUID ENGINE

**Jean G. Pachins, Pavillons sous Bois, France, assignor to Societe Anonyme: Poclain, Le Plessis Belleville, France,**

**Filed Feb. 13, 1974, Ser. No. 442,043**
**Claims priority, application France, Feb. 27, 1973, 73.06942**
**Int. Cl.² F16D** *31/02*
**U.S. Cl. 60—486** **7 Claims**

1. Control circuit for a pressurized fluid engine comprising:
a first main conduit and a second main conduit for connection to the fluid engine;
means for connection to a main source of pressurized fluid;
means for connection to a return for non-pressurized fluid;
a supply selector having at least two positions, which, in its first position, connects said first conduit to said main source connection means and said second conduit to said fluid return connection means and, in its second position, blocks said first and second main conduits at its position;
means for connection to a secondary source of pressurized fluid;
a secondary conduit connecting said secondary source connection means to said first main conduit;
a non-return valve in the said secondary conduit permitting passage of fluid from said secondary source connection means to said first main conduit;




a distributor having two positions, arranged in said first and second main conduits, defining two separate portions of each of said main conduits, and which, in its first position, places said two portions of each of said main conduits in communication and, in its second position, isolates said two portions of each said respective main conduit from each other;
a connection conduit which, in the second position of the distributor, connects those of said portions of said first and second main conduits to be connected to the engine;
a discharge conduit which connects said connection conduit to a return connection means;
a main restriction in said discharge conduit; and
a secondary restriction in the portion of said connection conduit between the union of said connection conduit to said first main conduit and to said discharge conduit.

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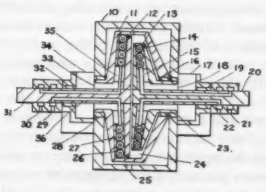
**3,895,491**

## TURBINE WITH DUAL ROTORS

**Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042**

**Filed Oct. 11, 1973, Ser. No. 405,628**
**Int. Cl. F01k** *25/02*; **F02c** *1/04*; **F02g** *1/00*
**U.S. Cl. 60—650** **8 Claims**




1. A turbine for generating power from a centrifugally compressed fluid comprising:

enclosure means;

a primary rotor means rotatably mounted in said enclosure means for subjecting the fluid therein to a centrifugal force field; said primary rotor means having a first passageway formed therein for providing a means for introducing the fluid to be compressed; said primary rotor means having internal vanes defining radially extending passageways communicating with said first passageway for ensuring that the fluid in said radially extending passageways rotates with the velocity of said primary rotor means; a nozzle formed at the end of each radially extending passageway being forwardly oriented to discharge the compressed fluid in the radially extending passageways in the direction of rotation for accelerating the fluid to a tangential velocity that is greater than the tangential velocity of said primary rotor means; said discharge nozzles being shaped to obtain the highest obtainable exit velocity for the fluid for the available energy differential available between entry and exit ends of said nozzle;

a first shaft axially formed in said primary rotor means for inputting the necessary power to affect rotation thereof; said shaft extending partially through said primary rotor means with one end of said shaft adjacent an enlarged cavity portion formed axially within said primary rotor means and an opposite end of said shaft extending outwardly from a first side of said enclosure means;

a secondary rotor means positioned within said enlarged cavity and rotatably mounted coaxially with said primary rotor means and said first shaft for absorbing the work associated with the deceleration of the fluid exiting from said discharge nozzles of said primary rotor means; and secondary rotor means having an egress passageway formed therein for providing a means for egress of the fluid compressed in said primary rotor means, said secondary rotor means having internal vanes defining radially inwardly extending passageways communicating with said egress passageway for ensuring that the fluid there in rotates with the velocity of said secondary rotor means; a second shaft axially formed in said secondary rotor means for outputting power effected by the rotation thereof, said shaft extending substantially through said secondary rotor means with an end of said second shaft extending outwardly from a second opposite side of said enclosure means.

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**3,895,492**

## POWER PLANT

**Siegfried Förster, Alsdorf, Ottenfeld; Günter Hewing, Julich, and Peter Quell, Haaren, all of Germany, assignors to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung, Julich, Germany**

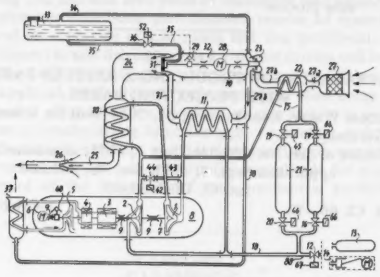
**Filed Dec. 26, 1973, Ser. No. 428,230**

**Claims priority, application Germany, Dec. 27, 1972, 2263559**

**Int. Cl. F01k** *1/00, 3/00*

**U.S. Cl. 60—659** **26 Claims**

1. In a power plant; a compressor, and a gas turbine on a common shaft and means to withdraw power from the shaft, a drive motor on the shaft for starting the shaft, conduit means forming an inner gas circuit connecting said compressor and turbine in closed circuit, gas storage means having a gas pressure intermediate of the pressure of the upstream side and the downstream side of said compressor and having valved connections with the upstream and downstream sides of said compressor, a gas heater in said conduit on the upstream side of said turbine and a gas cooler in said conduit on the downstream side of said turbine, a bypass having a controllable flow area between the upstream and downstream side of said compressor an outer gas circuit for an ignitable mixture of burning gas, a blower for said gas, a burner with a combustion chamber located in a direction of the gas flow behind said blower and said outer gas circuit being in heat exchange relation with said cooler before burning and after burning being in heat exchange relation with said heater, the burning gas being composed of air and a gaseous fuel, the outer gas circuit being open to the atmosphere at both ends, an ignition device for the combustion chamber, fuel supply means connected to said combustion chamber, gas supply means connected to said conduit means to supply gas thereto to maintain a predetermined minimum pressure in said conduit means; control means for controlling the pressure in said conduit means and



operable to control said valved connections of said gas storage means and the effective area of said bypass being controlled thereby along with the speed of said blower and for controlling the supply of fuel to said combustion chamber; control means for controlling the energization of said drive motor and the actuation of said ignition device; and a monitoring device for detecting the speed of said shaft and operable to control the effective area of said bypass.

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**3,895,493**

## METHOD AND PLANT FOR THE STORAGE AND RECOVERY OF ENERGY FROM A RESERVOIR

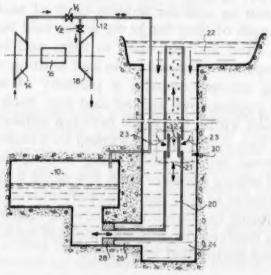
**Georges Alfred Rigollot, 66, ave. Henri-Martin, 75116 Paris, France**

**Filed Apr. 25, 1973, Ser. No. 354,447**

**Claims priority, application France, May 3, 1972, 72.15654**

**Int. Cl. F01k** *1/00, 3/00*

**U.S. Cl. 60—659** **9 Claims**



1. Method for the storage in and recovery of energy from an enclosed reservoir in which such energy is stored in the form of a compressed gas and is recovered through work performed by said gas upon withdrawal from said reservoir, comprising the steps of: introducing gas under pressure into said enclosed reservoir which is at least partially filled with water to store the gas therein at a substantially constant pressure, said water being gasified upon absorption of said pressurized gas, maintaining water pressure within said reservoir substantially equal to the pressure of the stored gas therein by means of (a) a column of water interconnecting said reservoir below the interface of the water and pressurized gas therein and (b) a

water reserve completely surrounding the column of gasified water and being of a greater volumn than said reservoir, said water reserve and said column of water having surface levels higher than the water surface level in said reservoir, periodically recovering energy from said reservoir by withdrawing gas from said reservoir at said constant pressure for use in a work zone, and, during pressurization of gas in said reservoir, blocking the flow of gasified water completely through said column of water by communicating the gasified water in said column of water, at a predetermined level thereof, with said non-gasified water in the water reserve to dilute the concentration of the pressurized gas in the water for dissipating the energy in the gas and thereby preventing water in the reservoir from being emptied during pressurization.

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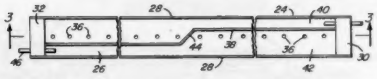
**3,895,494**

## GRAVITY FEED, CONTROLLED FLOW RATE PLANT WATERING SYSTEM

**Frank S. Dardano, 2110 S. Wolcott Ct., Denver, Colo. 80219**

**Filed Mar. 19, 1974, Ser. No. 452,697**
**Int. Cl.[2] E02B** *13/00*
**U.S. Cl. 61—12** **4 Claims**



1. A gravity feed plant watering system including an elongated upwardly opening trough including a bottom wall, interconnecting a pair of upstanding longitudinal side walls and a pair of upstanding end walls, the opposite ends of said trough including water inlet means and said bottom wall including a plurality of longitudinally spaced gravity flow outlet openings formed therein, said trough including a longitudinal upstanding partition extending between said end walls, spaced intermediate said side walls and sealed relative to said bottom and end walls to divide the interior of said trough into two separate opposite side compartments, said partition including opposite end portions disposed on opposite sides of the longitudinal centerline of said trough and a central portion extending across said centerline and joining said opposite end portions, the outlet openings in one end portion of said trough being disposed on one side of the corresponding end portion of said partition and the outlet openings in the other end portion of said trough being disposed on the other side of the corresponding end portion of said partition, the central portion of said partition crossing the centerline of said trough between adjacent outlet openings, the opposite end portions of said partition being disposed on opposite sides of said centerline, the water inlet means at opposite ends of said trough opening through the corresponding end walls thereof on the sides of the adjacent end portions of said partition remote from the bottom wall outlet openings in those end portions of the trough.

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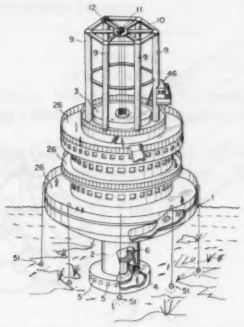
**3,895,495**

## PLEASURE BOAT FOR OBSERVATION IN THE SEA

**Shigeru Akazaki, 2 of 23 Kamiuma 5, Setagaya, Tokyo; Masaaki Endo, 490 Ohnaricho, Ohmiya, Saitama, and Mamoru Shinozaki, 21 of 6 Yakumo 5, Meguro, Tokyo, all of Japan**

**Filed Jan. 22, 1974, Ser. No. 435,466**
**Claims priority, application Japan, Jan. 23, 1973, 48-10062**
**Int. Cl. E02b** *17/00;* **B63b** *35/00*
**U.S. Cl. 61—46** **6 Claims**

1. A vessel for undersea observation comprising a hull means having deck means, an observation tower means located at the central portion of said hull means and movable vertically therethrough, ballast means at the upper portion of said observation tower means, a watertight undersea observation chamber at the lower portion of said observation tower means, passage means connecting the deck means to the observation chamber, turret means on the hull means and positioned above said observation tower means in both its



raised and towered positions, means mounted in the turret means for raising and lowering the observation tower means, said hull means and said tower means being circular in plan view and the hull means being substantially larger in plan than said tower means.

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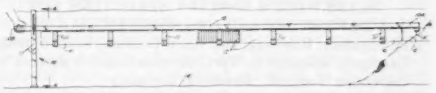
**3,895,496**

## TOOL FOR INSTALLATION OF FLEXIBLE GROUND CONDUIT

**Lloyd J. Perrott, and Robert D. Stores, both of Eugene, Oreg., assignors to Lloyd J. Perrott, Eugene, Oreg., a part interest**

**Filed Oct. 5, 1973, Ser. No. 403,817**
**Int. Cl. E02b** *1/00*
**U.S. Cl. 61—63** **2 Claims**



1. A hand tool for the manual setting to grade of consecutive flexible conduits below the ground surface, said tool comprising,

an elongate rigid member,

a series of clips depending at intervals from said elongate member, each of said clips being of a highly flexible nature and in a normal unflexed state having a bite of slightly lesser dimension than a crossectional dimension of the conduit, said clips having outwardly directed end segments contactable with the conduit during a closing movement between the tool and conduit,

an arcuate plate attached to one end of said elongate member for rested placement on the end of a previously laid conduit to align a clip supported conduit with a previously laid conduit,

a level located adjacent the other end of said rigid member for indicating to the worker the grade of the rigid member and hence the grade of the mounted flexible conduit,

an adjustable support structure attached to the other end of said rigid member to permit support of the conduit at a desired grade while the worker backfills the conduit receiving trench, and

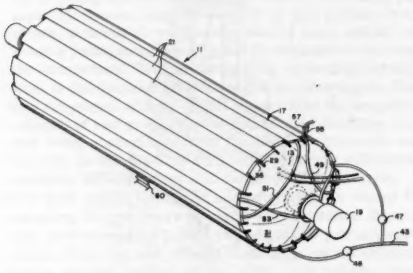
said clips being disengageable from the conduit therein by the manual lifting of the elongate rigid member in the presence of backfill material bearing on the conduit.

3,895,497

## WET SHIELD FOR A CRYOGENIC VESSEL

Glen E. McIntosh, and John D. Loudon, both of Boulder, Colo., assignors to Cryenco, Denver, Colo.

Filed Mar. 22, 1974, Ser. No. 453,811
Int. Cl. F17c 1/12
U.S. Cl. 62—45 13 Claims



1. A wet shield cryogenic fluid container comprising:
an inner-shell means for receiving and storing cryogenic fluids;
a wet shield surrounding said inner-shell, said wet shield comprising:
shielding tank means for receiving and storing a quantity of a cryogenic shielding liquid to intercept heat, said shielding tank means including a plurality of shielding tanks mounted side-by-side around said inner shell; and,
an interconnecting assembly means for supplying said cryogenic shielding liquid to said plurality of shielding tanks and for venting spent gases from each of said shielding tanks at an upper portion thereof, whereby said cryogenic shielding liquid is retained in pockets radially positioned about said inner-shell container.

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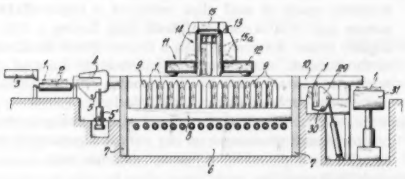
3,895,498

## APPARATUS AND METHOD FOR COOLING METAL SLABS WITH A UNITARY STRUCTURE FOR DEPOSITING AND GRASPING THE SLABS

Willi Manthey, Duisburg, and Horst Deiwick, Krefeld, both of Germany, assignors to BWG-Bergwerk-und Walzwerk Machinenbau G.m.b.H., Duisburg, Germany

Filed Oct. 13, 1972, Ser. No. 297,470
Claims priority, application Germany, Nov. 24, 1971, 2158091
Int. Cl. B66f 9/18; B65g 47/34
U.S. Cl. 62—64 7 Claims



7. The method of transporting metal slabs into and from a cooling basin which comprises
a. moving a carriage having slab grasping means thereon in steps from a slab feeding station at one end of an elongate cooling basin to the location of a vacant compartment and an adjacent slab-containing compartment in a succession of slab cooling compartments provided in and along said basin, next from said location to a slab discharge station at the other end of said basin, and then back to said feeding station for a next series of such steps, said grasping means constituting two downwardly opening slab receiving pockets in parallel side-by-side relation;
b. while said carriage is at said feeding station placing and latching a hot slab in one only of said pockets;
c. while said carriage is at said location; lowering said grasping means into said basin so as to place said hot slab in said vacant compartment and to place the other of said pockets in encompassing relation to a cooled slab in said slab-containing compartment, then releasing said hot slab from said one pocket and latching said cooled slab in said other pocket, and then raising out of said basin said grasping means with only said cooled slab held therein; and
d. While said carriage is at said discharge station releasing said cooled slab from said other pocket.

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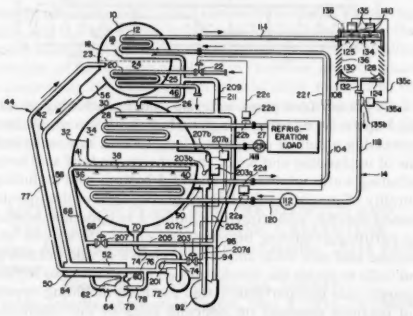
3,895,499

## ABSORPTION REFRIGERATION SYSTEM AND METHOD

Neil E. Hopkins, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 29, 1974, Ser. No. 474,299
Int. Cl. F25b 15/06
U.S. Cl. 62—101 3 Claims

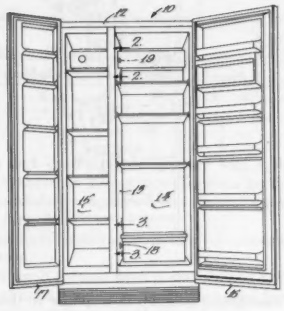



1. A method of operating an absorption refrigeration apparatus of the type comprising a generator, a condenser, an evaporator, and an absorber all connected to provide a continuous cycle absorption system wherein an absorbent solution, consisting essentially of an aqueous solution of a hygroscopic salt, and a refrigerant consisting essentially of water, are circulated through said system and wherein relatively dilute solution is transferred to the generator wherein water vapor is released to the condenser, and wherein the condensed vapor from said condenser is transferred to said evaporator where it is brought into indirect contact with a heat exchange medium supplied to a load, and wherein the water vapor released in said evaporator is absorbed by absorbent solution in said absorber, thereby diluting the same, and wherein relatively concentrated solution is transferred from said generator to said absorber to maintain the absorbent solution at an effective concentration level, comprising the steps of: withdrawing liquid refrigerant from said evaporator by means of a pump and recirculating it back into indirect contact with said heat exchange medium to provide a refrigerant circuit, collecting liquid refrigerant in said evaporator to maintain a reservoir thereof, the level of which fluctuates, in the regular operation of the system between a normal upper limit indicative of a high demand condition and/or high absorber temperatures and a normal lower limit indicative of low demand conditions and/or low absorber temperatures; sensing the level of refrigerant collecting in said evaporator; and transferring absorbent solution from said absorber to said refrigerant circuit when the level of said refrigerant is substantially below said normal lower level to maintain an adequate supply of liquid in said circuit and thereby prevent cavitation of said pump.

## 3,895,500
## ELECTRICAL HEATERS FOR REFRIGERATORS

**Ralph D. Barton, and William J. Buchser, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Sept. 18, 1974, Ser. No. 507,132**
**Int. Cl. F25d** *23/06*
**U.S. Cl. 62—273** **11 Claims**

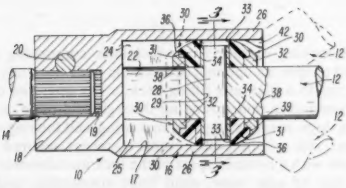


1. In an apparatus having an insulative wall, means for controlling moisture collection in the wall comprising:
an elongated socket element formed of a thermally conductive material having a tapered tip inserted into a preselected portion of said wall having a surface on which moisture collection is to be controlled, and an outer end opening to exteriorly of said wall;
an electric heater element received in said socket element; and
means at said outer socket end for electrically connecting the heater to a power source for heating said preselected wall portion whereby moisture collection on said surface at said preselected portion is effectively controlled.

## 3,895,501
## UNIVERSAL JOINT

**Horace D. Holmes, Farmington Hills, Mich., assignor to Masco Corporation, Taylor, Mich.**

**Filed Nov. 12, 1973, Ser. No. 414,934**
**Int. Cl. F16d** *3/02*
**U.S. Cl. 64—8** **2 Claims**

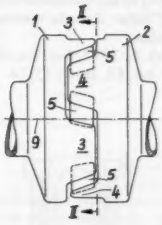


1. A universal joint comprising a first rotative torque-transmitting member provided with an axially outwardly opening socket, a second rotative torque transmitting member having an end received axially in said socket to act therein about a swivel axis in 90° intersecting relation to the axis of said second member, said socket being internally defined in part on opposite sides of the socket axis by pairs of rigid, transversely spaced and generally flat wall surfaces, and means drivingly connected in said socket to said second torque-transmitting member to operate about said swivel axis in transmitting torque between said members, said means including resilient cushion parts shiftable unitarily and axially with said second member relative to the socket and positively transmitting cushioned torque directly between said parts of socket wall surfaces and said second member in any position of the latter about said swivel axis, said cushion parts each including a cushion element of resiliently compressible material, said element having generally flat side surfaces slidably engaged between the respective pairs of wall surfaces of the socket and acting directly against said wall surfaces in said resiliently cushioned transmission of torque.

## 3,895,502
## JAW COUPLING

**Wilhelm Schwarz, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany**

**Filed Oct. 19, 1973, Ser. No. 407,862**
**Claims priority, application Germany, Oct. 28, 1972, 2253041**
**Int. Cl. F16d** *3/68*
**U.S. Cl. 64—14** **6 Claims**

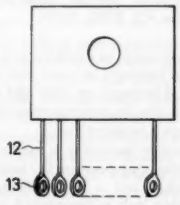


1. A rotatable jaw coupling which includes: a first rotatable coupling section, a second rotatable coupling section axially aligned with said first coupling section, each of said two coupling sections having jaws including concave surfaces tapered from roots to end faces thereof as well as facing toward the other coupling sections and each jaw of one coupling section extending between two jaws of the other coupling section and vice versa, elastic power transmitting bodies respectively interposed between each two jaws facing each other and respectively pertaining to said two coupling sections, said elastic power transmitting bodies and said jaws engaging each other along surfaces which at least within regions in which tangential forces are transmitted extend at an incline with regard to the axis of rotation of said coupling, and means associated with said coupling for axially adjusting at least one of said coupling sections relative to the other coupling section.

## 3,895,503
## YARN GUIDES FOR WARP KNITTING MACHINES

**Karl Kohl, 10 Chlorodont Strasse, Obertshausen, Germany (6053)**

**Filed Apr. 16, 1973, Ser. No. 351,731**
**Int. Cl. D04b** *27/02, 27/06*
**U.S. Cl. 66—86 R** **4 Claims**



1. A yarn guide unit for a warp knitting machine comprising

a mounting unit, said mounting unit having a transverse axis, and

a plurality of yarn guides each guide comprising

a shaft portion having a longitudinal axis and

a substantially flat head portion attached to said shaft portion,

said head portion having an eyelet therethrough and being bisected by said longitudinal axis, said longitudinal shaft axis being perpendicular to said transverse mounting unit axis,

said guide shafts being mounted side by side in said mounting unit and the longitudinal axes of said shafts lying upon a common principal plane, said principal plane also passing thru said transverse axis and the center of said eyelet wherein each of said head portions subtending an angle of between about 30° to about 45° to said principal plane which bisects said head portions.

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**3,895,504**

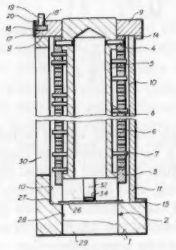
**QUICKLY REPLACED PATTERN DRUM**

**Miroslav Brandstatter, Brno, Czechoslovakia, assignor to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia**

**Filed Oct. 5, 1973, Ser. No. 403,804**

**Int. Cl. D04b** *15/74*

**U.S. Cl. 66—156** **5 Claims**



1. A pattern device having a quickly replaced pattern drum having pegs projecting from the peripheral surface of said drum, comprising a body for supporting the drum, a cover overlying one end of the body, bolts each having a recess arranged on the said end of the body and projecting outwardly thereof, openings in said cover in register with said bolts on said end of said body, thereby permitting the bolts to engage in said openings, a transverse slot in said cover, a ledge adapted to slide in said slot into a position wherein it simultaneously engages in said recesses in said bolts, and stop means selectively securing said ledge in said position.

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**3,895,505**

**DOOR LOCK**

**Georg Wasserfaller, 5923 Post Landskron, Gratschach, Austria**

**Filed June 27, 1974, Ser. No. 483,686**

**Claims priority application, Austria, June 29, 1973, 5789/73**

**Int. Cl. E05b** *59/00*

**U.S. Cl. 70—111** **7 Claims**

1. A door lock comprising, in combination:

1. a latch reciprocal between an open and locked position,

2. a bolt reciprocal between an open and locked position,

3. key-operable means for reciprocating the bolt between the locked and open position,

4. a locking mechanism including a locking bolt movable between a latch engaging position for holding the latch in the locked position and a latch disengaging position wherein the locking bolt is disengaged from a latch for permitting the latch to be reciprocated into the open position, and

5. means operably associated with the reciprocal bolt and the movable locking bolt for moving the locking bolt into

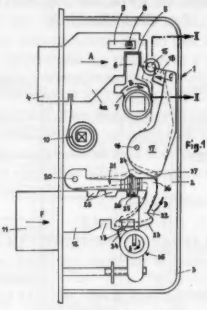

Fig. 1

the disengaged position in response to the key-operated reciprocation of the bolt into the open position thereof.

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**3,895,506**

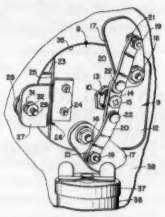
**LOCKING CLOSURE FOR FUEL TANK**

**Steve F. Gallego, 125 E. 40th St., Tuscon, Ariz. 85713**

**Filed Apr. 19, 1974, Ser. No. 462,421**

**Int. Cl. E05b** *65/12*

**U.S. Cl. 70—168** **2 Claims**

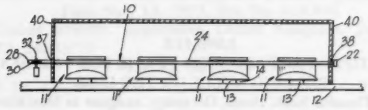


1. A locking closure for a fuel tank comprising a plate adapted to span an opening of a vehicle body normally affording access to a fuel tank filling neck, a key operated cylinder lock mounted in and extending through said plate, a pair of locking dogs, means swingably mounting said locking dogs on an inner side of the plate, crank members secured to and rotatable with a rotatable part of the lock and disposed on the inner side of said plate, rigid links connecting said crank members and locking dogs for simultaneously exerting either a thrust or pull on the locking dogs when the rotatable part of the lock is turned by a key applied to the lock from the other outer side of the plate, for moving the locking dogs between extended, locked positions against the inner side of the vehicle body or retracted unlocked positions out of engagement with the vehicle body and in sufficient close proximity to one another for passage through said opening, a bracket secured to and projecting from said inner side of the plate, a resilient bumper supported by said bracket and disposed to yieldably engage against a portion of the inner side of the body when said dogs are in locking positions, and means to adjustably position the bumper relative to the bracket for varying the pressure exerted by the bumper on said body portion.

## 3,895,507
## SAFETY LOCK DEVICE FOR A STOVE

Henry Moy, Bronx, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 23, 1974, Ser. No. 517,372
Int. Cl.[2] F16K *35/00*
U.S. Cl. 70—177 5 Claims




1. A safety lock device in combination with a plurality of aligned control knobs on a front face of a stove for the prevention of the accidental rotation of said control knobs of said stove, which comprises:

each control knob fixably secured to a valve operating stem of said stove;

said control knob formed from a disc shaped bottom base and an upward extending rectangular shaped flange member affixed centrally to said bottom base;

an eye blot member horizontally extending outward from said front face of said stove;

a U-shaped member having elongated leg members;

said U-shaped member communicating with said eye blot member, wherein said legs extend across said stove;

each said flange member of each said knob extending outward between said legs; and

a first means of pulling said legs inward toward each other, wherein said pulled in legs engage said flange members of said knobs preventing axially rotation of said knobs.

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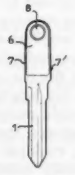
## 3,895,508
## FLAT KEY

Serge Crasnianski, Grenoble, France, assignor to Cransianski France S.A., France

Filed Nov. 23, 1973, Ser. No. 418,223
Claims priority, application France, Apr. 24, 1973, 73.14753; June 20, 1973, 73.22467
Int. Cl. E05b *19/04*
U.S. Cl. 70—395 5 Claims




1. A flat key, comprising;

a shank which comprises, a flat and narrow profile section, and a substantially similarly flat and narrow shank head, said shank head slightly tapering toward an end thereof remove from the profile section; and

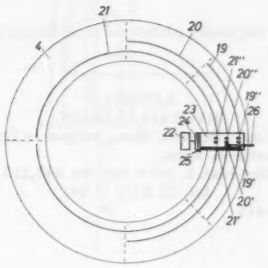
a key head surrounding the shank head, the key head being thicker and wider than the shank head, with an aperture extending through the key head and slightly tapering to fit the slightly tapering shank head with wedge action between said heads;

whereby said heads are interconnected tightly without employment of crimped or welded portions of the shank or key head.

## 3,895,509
## BENDING MACHINE FOR RODS, WIRES AND OTHER ELONGATED ARTICLES OF STEEL, ETC.

Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, (56) Wuppertal-Barmen, Germany

Continuation-in-part of Ser. No. 94,251, Dec. 2, 1970, abandoned. This application May 18, 1973, Ser. No. 361,849
Claims priority, application Germany, Dec. 3, 1969, 1960670
Int. Cl. B21d *7/02, 7/12*
U.S. Cl. 72—21 3 Claims




1. A bending machine for rods, wires and other elongated articles of steel and other materials, including a bending platen for supporting bending tools, said bending platen being rotatable and directionally controllably driven, a drive motor for the plate, setting means operably associated with the platen for principal bending angles, said setting means having elements corresponding to the specific principal bending angles and which can be actuated in any desired sequence, an electrically operated control system for automatically controlling a bending operation beyond a set principal bending angle to compensate for deviations between the actual bending angle achieved and the required bending angle which may otherwise occur, the improvement being there is provided in association with each principal bending angle, an adjustable time delay device, with the aid of which the drive motor for the platen, after having reached a given principal bending angle, remains activated for a further period of time without changing the position of the setting means, and each delay device comprising an adjustable potentiometer arranged to vary the timing constant of a condenser/resistor link.

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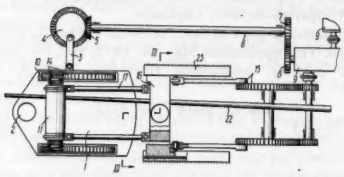
## 3,895,510
## TUBE COLD ROLLING MILL

Sergei Nikolaevich Kozhevnikov, Vystavochnaya ulitsa 3, kv. 73, Kiev; Arkady Semenovich Tkachenko, kina prospekt Gagarina, 63, kv. 22 ulitsa Babush 8/12, kv. 5, both of Dnepropetrovsk, all of U.S.S.R.

Filed July 10, 1972, Ser. No. 270,563
Int. Cl. B21b *21/00*
U.S. Cl. 72—214 2 Claims

1. A tube cold rolling mill comprising a stand with rolls having a variable-section groove provided along a spiral line with a variable inclination angle along the groove length; a housing with guides for said stand made so as to ensure its reciprocal-rolling motion relative to the vertical axis; a drive with a crank mechanism for moving the stand along the guides of said housing; a linkage of said housing with the drive of said stand made so that the angle formed by the guides of said housing and the axis of rolling is at each moment of time equal to said variable inclination angle of the roll groove; a crosshead, the housing of which is hinged to a crank mechanism of said stand drive and having a cavity to accommodate a holder;

said holder being disposed in said cavity of the housing of said crosshead and able to turn relative to the vertical axis and



having a hole for passing a billet and being hinged with tie rods of said stand.

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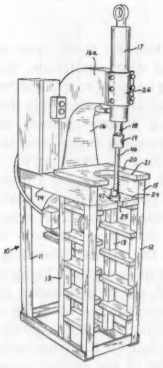
**3,895,511**
**HYDRAULIC PRESS**
**Daniel A. Delmore, Hopkins, Minn., assignor to Tennant Company, Minneapolis, Minn.**
**Filed Mar. 1, 1974, Ser. No. 447,213**
**Int. Cl. B21j** *13/04*
**U.S. Cl. 72—448** **4 Claims**



1. For reciprocating a tool along a given axis to perform a work operation on a work piece, a hydraulic press comprising a frame, a first piston cylinder combination having a first cylinder and a first piston rod reciprocally operated by the cylinder, said first combination having a fixed length piston stroke, means for mounting the combination on the frame, tool mounting means adapted for attaching a tool to the first piston rod to move therewith along said axis, a platen for supporting a work piece supporting jig or work piece to have a work operation performed on the work piece by a tool mounted by the tool mounting means and moved through actuation of said first combination, means mounted on the frame for supporting the platen in various selected positions at varying spacings from the first cylinder in alignment with the path of movement of the tool mounting means, a work piece or jig support plate fixedly mounted on the frame between the platen support means and the first piston rod in its retracted position and substantially spaced from the first piston rod in its retracted position, said support plate having a cut out of a size and located to have a tool extended therethrough, said frame comprising a pair of spaced frame members extending from the support plate in a direction away from said first combination, said platen supporting means including a platen support mounted on each frame member at the same distance from the support plate as the platen support on the other frame member, said platen supports being spaced from one another and extending from the respective frame member toward the other for supporting the platen in alignment with the cut out, and a second piston cylinder combination having a second cylinder and piston rod, and means for mounting the second combination on the frame, said combination mounting means mounting the cylinders on the same side of the support plate on opposite sides of the cut out and said tool mounting means being attached to the second piston rod.

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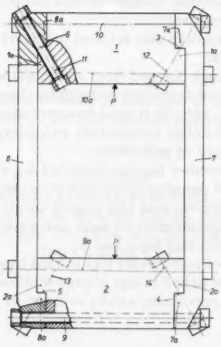
**3,895,512**
**MULTIPLE-PART MACHINE FRAME FOR PRESSES, ROLLING MILLS OR THE LIKE**
**Ernest Theodor Sack, Hosel, Germany, assignor to Maschinenfabrik Sack GmbH, Dusseldorf-Rath, Germany**
**Filed Oct. 24, 1973, Ser. No. 368,687**
**Int. Cl.² B21J** *13/04;* **B30B** *15/04*
**U.S. Cl. 72—455** **3 Claims**



1. A composite machine frame for highly stressed power presses, rolling mills, and like applications, in which large working forces act to longitudinally deform and stretch the frame, and deformation-related impact relief forces, created by the abrupt cessation of said working forces, act to contract the frame, the machine frame comprising:

a pair of laterally spaced longitudinal frame members extending over substantially the entire length of the frame;

a pair of vertically spaced transverse frame members extending between the upper and lower extremities of the longitudinal frame members so as to constitute mating interfaces therebetween and to circumscribe a substantially rectangular frame opening;

first tie-rods extending lengthwise through the transverse frame members and perpendicularly through said longitudinal frame members for the creation of a transverse clamping force across the interfaces of these members;

a pair of oppositely oriented mating projections in each of the four interfaces between the longitudinal and transverse frame members; each pair of projections comprising a laterally outwardly extending projection of the transverse frame member, an inwardly extending overhanging projection of the longitudinal frame member, and intermediate, transversely oriented force-transmitting surfaces by which said projections engage each other for the transmission of the working forces from the transverse frame member to the longitudinal frame member; and

second tie-rods extending generally longitudinally through said pairs of mating projections along an axis which intersects their force-transmitting surfaces, said tie-rods being prestressed to such an extent that they maintain longitudinal clamping pressures on the force-transmitting surfaces between the longitudinal frame members and the transverse frame members of such a magnitude that the clamp-

ing pressures are at all times higher than the impact relief forces which tend to separate these members along said force-transmitting surfaces.

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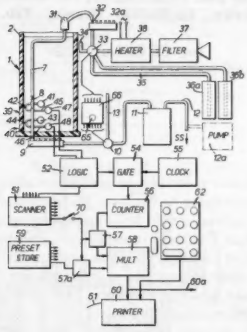
**3,895,513**
**VISCOMETRIC APPARATUS**

**Claude Alan Richardson, Egham, England, assignor to Stanhope-Seta Limited, Surrey, England**

**Filed Nov. 14, 1973, Ser. No. 415,641**
**Claims priority, application United Kingdom, June 12, 1973, 28033/73**
**Int. Cl. G01n** *11/06*
**U.S. Cl. 73—55** **9 Claims**




**1.** In viscometric appartus including a generally vertically disposed viscometry tube having an upper end and a lower end and including a capillary portion intermediate said ends and said tube having associated with said capillary portion fiducial marks so spaced that the time of passage of a liquid sample of predetermined volume is a measure of the viscosity of said sample, a suction source and valve means operable to connect said tube to said suction source and to the ambient air, the improvement which comprises:

a hood member applied to the upper end of said viscometry tube, said hood member having therein an aperture for injection of said liquid sample;

a reservoir of cleansing fluid;

first valve means coupled with said lower end of said viscometry tube;

second valve means;

and conduit means coupling said hood member with said second valve means;

said first valve means being operable to connect said lower end of said viscometry tube alternatively with said suction source and with the ambient air and said second valve means being operable to connect said hood member alternatively with said reservoir or with said ambient air.

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**3,895,514**
**BOTTLE TESTING APPARATUS**

**John D. Northup, 2460 Underhill Rd., Toledo, Ohio 43615**

**Filed Aug. 15, 1974, Ser. No. 497,751**
**Int. Cl. G01m** *3/02*
**U.S. Cl. 73—49.4** **7 Claims**

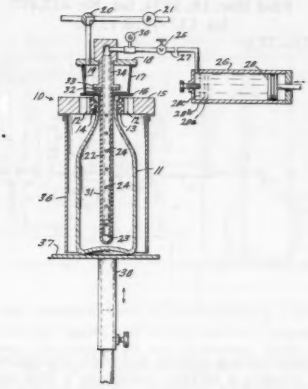
**1.** A bottle testing apparatus, comprising:

means for engaging the bottle in a testing position;

a flexible expandable bladder adjacent said engaging means for insertion into the interior of the bottle;

means for filling the bladder with fluid while the bladder is positioned inside the bottle, thereby expanding the bladder into contact with the interior wall surface of the bottle to apply pressure;

means for preventing the entrapment of air between the bladder and the interior surface of the bottle; and



means for withdrawing the fluid from the bladder, whereby said bladder may be removed from the bottle.

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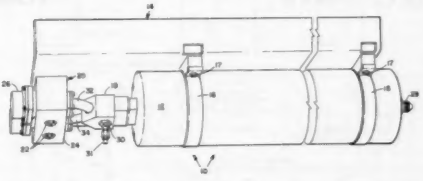
**3,895,515**
**WING THRUSTER**

**Ronald F. Vetter; Ray A. Miller; Edward A. Panella, all of Ridgecrest, and James J. Rosolanka, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Dec. 26, 1973, Ser. No. 428,598**
**Int. Cl.[2] G01N** *29/00*
**U.S. Cl. 73—71.5 R** **9 Claims**



**1.** In a thrust producing device for investigating wing flutter in aircraft, the improvement comprising:

a pressure accumulator;

means for pressurizing said accumulator;

valve means connected to said accumulator such that opening of said valve means releases fluid under pressure from said accumulator;

means mounting said valve means and said accumulator in position on a wing surface near the outboard end thereof; and

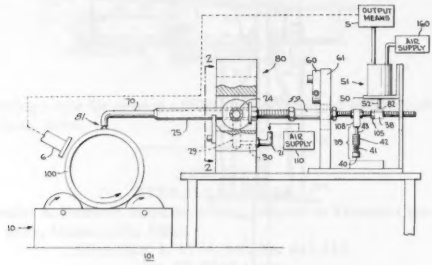
means connected to said valve means for remotely controlling the opening and closing of said valve means to cause reaction forces to act on said surface;

said valve means comprising at least one electrohydraulically operated thrust valve said thrust valve including first and second chambers communicating with said accumulator so that equal fluid pressure is maintained on both sides of a closure member; means for isolating said chambers from one another and venting one chamber to atmosphere in order to activate said thrust valve.

## 3,895,516
## APPARATUS FOR CONTOUR AND LINEAR MEASUREMENT USING FLUIDS

**Elmer L. Swartz, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Mar. 18, 1974, Ser. No. 452,477**
**Int. Cl.[2] G01B** *13/06*
**U.S. Cl. 73—37.6** **5 Claims**

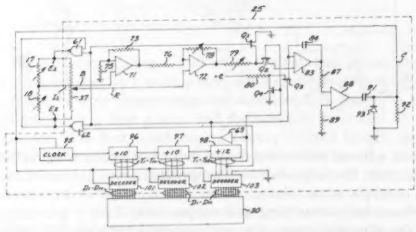



1. A noncontacting contour and linear measurement apparatus for gauging a surface comprising a first fluid source means mounted in spaced relation to the surface and establishing a constant jet of fluid engaging said surface, lever means to rotate said first source means relative to the surface to continuously track the configuration of said surface, a positional sensing means to determine the position of an exteriority of the lever means, located adjacent to the lever means, and a fulcrum means mounted in spaced relation to the exteriority of said lever means and establishing a constant jet of fluid for supporting said exteriority.

## 3,895,517
## ELECTRONIC TORQUE WRENCH

**William M. Otto, Orange, Calif., assignor to JO-Line Tools, Inc., Anaheim, Calif.**

**Filed Jan. 14, 1974, Ser. No. 433,247**
**Int. Cl. G011** *1/22*
**U.S. Cl. 73—88.5 R** **5 Claims**

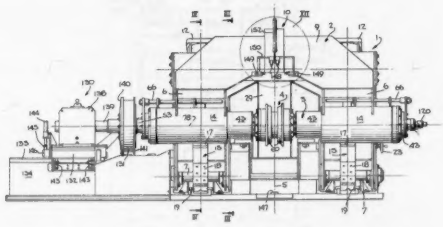



1. A strain readout apparatus for displaying a numerical equivalent of strain deformation of a structure, comprising:
an electrical signal source;
bridge means operatively connected for excitation to said signal source for developing a first electrical signal indicative of the strain deformation of the structure;
accumulating means connected to said bridge means for accumulating a second electrical signal substantially equal to a fixed time produce of said first electrical signal integrated over a first fixed interval of time;
decay means connected to said signal source and to said accumulating means to be rendered operative subsequent to the expiratin of said first fixed interval of time for subtracting a fixed signal rate determined by said signal source for a variable interval of time from said second electrical signal to reduce said second electrical signal to a predetermined level;
counting means connected to said accumulating means and said decay means for providing a first count corresponding to said first fixed interval of time and a second count corresponding to said variable interval of time; and
readout means connected to said count means for reading out said second count.

## 3,895,518
## TIRE TESTING MACHINE

**Jean R. Leblond, Compiegne, France, assignor to Uniroyal (France), Clairoix, France**

**Filed Jan. 10, 1974, Ser. No. 432,256**
**Claims priority, application France, Feb. 19, 1973, 73.05810**
**Int. Cl. G01m** *17/02*
**U.S. Cl. 73—146** **34 Claims**

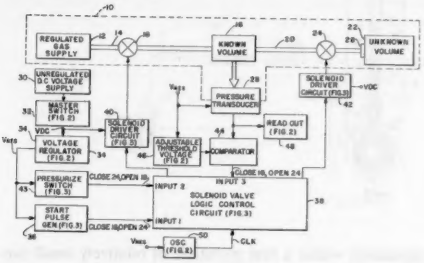


1. Apparatus for measuring dimensional characteristics of a pneumatic tire sample, said apparatus comprising:
a. a frame;
b. a pair of coaxially aligned, confronting, bead-holding members shiftably supported on said frame for movement toward and away from one another and, thereby, into and out of bead holding association with corresponding bead region of a pneumatic tire sample;
c. power means for selectively shifting said bead-holding members toward and away from one another;
d. locking means for clamping said bead-holding members to one another when the latter are in bead holding association with the tire sample;
e. tire inflation means operatively associated with said bead-holding members for inflating the tire sample between and from within said bead-holding members when the latter are in bead holding association with the tire sample;
f. tire sensing means shiftably mounted on said frame for effecting measurement of selected dimensional characteristics of the inflated tire sample;
g. further power means for shifting said tire sensing means into and out of operative engagement with selected portions of the tire sample, and
h. drive means for rotating the clamped bead-holding members and, thereby, the tire sample relative to said tire sensing means when the latter is in operative engagement with the tire sample, said frame including a stationary frame portion and a pivotal frame portion hinged upon said stationary frame portion, said stationary frame portion including a road-simulating drum freely journaled thereupon, said pivotal frame portion supporting said bead-holding members and being displaceable pivotally relative to said stationary frame portion such that the tire sample held by said bead-holding members is engageable radially with said drum.

## 3,895,519
## ELECTRONIC CONTROL SYSTEM FOR FLUID MEASUREMENT OF A CLOSED AIR SPACE

**Jean C. Bouchy, and T. J. Hardman, both of Cincinnati, Ohio, assignors to McNay Equipment Company, Inc., Cincinnati, Ohio**

**Filed June 25, 1974, Ser. No. 482,884**
**Int. Cl. G01f** *17/00*
**U.S. Cl. 73—149** **5 Claims**




1. A system for measuring an unknown volume, comprising a source of fluid pressure, a vessel of predetermined volume, first electrically controlled valve means having open and shut conditions and being operable to provide a first fluid connection between said source of predetermined pressure and said vessel in said open condition and to interrupt said first fluid connection in said shut condition, second electrically operated valve means having open and shut conditions and being operable in said open condition to provide a second fluid connection between said vessel and the unknown volume and to interrupt said second fluid connection in said shut condition, transducer means in fluid communication, with said vessel between said first and second valve means for providing an electrical output analog of the pressure in said vessel, an electrical control circuit responsive to a start pulse, a pressurize signal and the output of said transducer means for performing the following functions in sequence: (1) in response to said start pulse shutting said first valve means and opening said second valve means, (2) in response to said pressurize signal, shutting said second valve means and opening said first valve means to charge said vessel with pressure, and (3) in response to the output of said transducer attaining a predetermined level, shutting said first valve means and opening said second valve means to discharge the pressure in said vessel into the unknown volume, whereby the output of said transducer when the pressures in said vessel and in the unknown volume are at equilibrium is a measure of the unknown volume.

## 3,895,520
## WELL LOGGING METHOD USING WELL LOGGING TOOLS RUN THROUGH A DRILL STEM TEST STRING FOR DETERMINING IN-SITU CHANGE IN FORMATION WATER SATURATION VALUES

**Walter H. Fertl, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed July 27, 1973, Ser. No. 383,220**
**Int. Cl. E21b** *49/00*
**U.S. Cl. 73—152** **13 Claims**

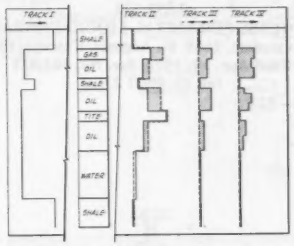
1. A well logging method comprising: positioning s drill stem test string or the like in a borehole near the formation zone of interest; positioning a logging tool through a portion of the drill stem test string or the like generally near the formation zone of interest during a first logging run;

obtaining a first log from said logging tool having a first logging run tool response responsive to the formation fluid generally within the zone of interest;

removing a sample portion of the formation fluid generally from the formation zone of interest, thereby producing an in-situ change in the formation fluid in the zone of interest;

retrieving the sample portion of the formation fluid obtained from the formation zone of interest; and

obtaining a second log from said logging tool through a portion of the drill stem test string or the like generally

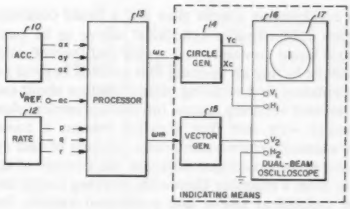



near the formation zone of interest during a second logging run, the logging tool having a second logging run tool response responsive to the formation fluid generally within the zone of interest, whereby the first and the second logging run tool responses indicating the formation potential productivity generally within the formation zone of interest.

## 3,895,521
## G-LOAD MEASURING AND INDICATOR APPARATUS

**James C. Howard, Sunnyvale, Calif., assignor to The United States Government as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.**

**Filed June 12, 1974, Ser. No. 478,802**
**Int. Cl. G01p** *5/00*
**U.S. Cl. 73—178 R** **19 Claims**




1. A *g*-load measuring apparatus for indicating the instantaneous relationship between instantaneous critical velocity and instantaneous maneuvering velocity of an aircraft being maneuvered, comprising:

signal generating means for developing linear acceleration signals respectively corresponding to the three orthogonal components, *ax*, *ay* and *az*, of the instantaneous linear acceleration of the aircraft;

signal generating means for developing angular velocity signals respectively corresponding to the three orthogonal components, *p*, *q* and *r*, of the instantaneous angular velocity of the aircraft;

signal generating means for developing a reference signal representing the design maximum critical acceleration ac for said aircraft;

processor means for receiving and processing said linear acceleration, angular velocity and reference signals to generate a first signal indicative of the instantaneous critical velocity of the aircraft and a second signal indica-

tive of the instantaneous maneuvering velocity of the aircraft; and

indicating means responsive to said first and second signals and operative to indicate the relationship of the instantaneous values of the critical velocity and the maneuvering velocity of the aircraft.

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**3,895,522**

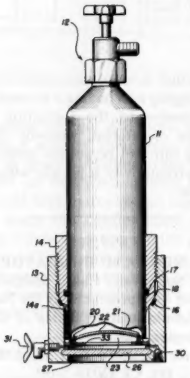
## SIGHT GLASS FOR METAL LIQUID CONTAINERS

**John A. Skvarenina, 2639 W. Augusta, Chicago, Ill. 60622**

**Filed Apr. 29, 1974, Ser. No. 465,431**

**Int. Cl. G01f** *23/02*

**U.S. Cl. 73—323** **10 Claims**



**1.** In combination a sight glass and a liquid container, said sight glass comprising: a cylindrical sleeve to be positioned about said liquid container at a sealed end thereof, said cylindrical sleeve having an opening that extends beyond said end of the container first securing means position about said container, second securing means on said cylindrical sleeve for engagement with said first securing means, a transparent window element secured across said opening of said cylindrical sleeve to be positioned adjacent the bottom of the container to form a chamber therewith, piercing means mounted on said cylindrical sleeve and positioned radially inwardly thereof to engage the bottom of the container and puncture same when said cylindrical sleeve is tightened by said first and second securing means, and annular seal means formed within said cylindrical sleeve to provide a fluid tight seal for said chamber when the bottom of the container is punctured by said piercing means, whereby the liquid within the container will enter said chamber for viewing to determine the quantity of liquid within the container.

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**3,895,523**

## THERMOMETER

**Bernard Nollen, Ahrensburg, Germany, assignor to Michael Obladen, Hamburg, Germany, a part interest**

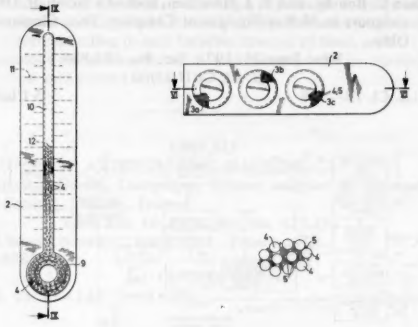
**Filed Oct. 2, 1974, Ser. No. 511,290**

**Claims priority, application Germany, Oct. 8, 1973, 2350441**

**Int. Cl.[2] G01K** *5/00*

**U.S. Cl. 73—356** **20 Claims**

**1.** A thermometer working on the basis of volume expansion of paraffinic hydrocarbons such as eicosane, heneicosane and docosane, and including an indicating agent disposed within an enclosed cavity wherein said paraffinic hydrocarbons are



encapsulated within a first multitude of relatively small capsules disposed within the indicating medium.

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**3,895,524**

## DIFFERENTIAL PRESSURE GAUGE

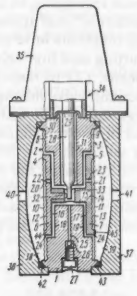
**Albert Yakovlevich Jurovsky, ulitsa Balliskaya, 4, kv. 94, Moscow, U.S.S.R.**

**Filed June 11, 1974, Ser. No. 478,336**

**Claims priority, application U.S.S.R., June 18, 1973, 1933173**

**Int. Cl. G01l** *19/04, 7/08*

**U.S. Cl. 73—393** **8 Claims**



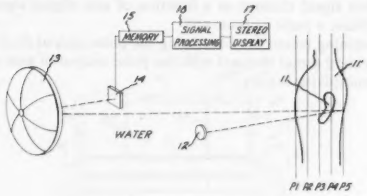
**1.** A differential pressure gauge comprising: a base; two membranes subjected to the effect of pressures; said membranes are fastened along the outer contour to the opposite sides of, and at a certain distance from, said base; a pressuretight space between said base and said membrane; two rigid discs secured, each, tightly to one of said membranes on a circular zone and located inside said pressuretight space; two chambers formed between said rigid discs and said membranes inside said circular zones; channels which put each of said chambers in communication with said pressuretight space; a hole in said base; a rigid connector passing through said hole and secured rigidly to said rigid discs; a means joined with said connector and intended to transmit the motion of said membranes; a means for transforming the motion of said membranes into an output signal, said means interacting with said first means; a liquid which fills said pressuretight space and said chambers

3,895,525

## ACOUSTIC IMAGING APPARATUS FOR VISUAL DISPLAY WITH DEPTH PERCEPTION

Charles W. Eichelberger, Schenectady, and Philip M. Garratt, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1973, Ser. No. 403,224
Int. Cl. G01n 29/04
U.S. Cl. 73—67.9 19 Claims




7. Acoustic imaging apparatus for visualizing in depth an object with internal acoustic heterogeneities comprising

means for generating a series of spaced acoustic pulses that are directed toward the object being examined,

focusing means for focusing a train of reflected acoustic echo signals produced by multiple reflection of each acoustic pulse by heterogeneities at multiple parallel planar regions at different depths within the object,

acoustic image converter means comprising a planar array of sensors each of which converts the focused acoustic echo signals to a variable electrical signal, a plurality of signal processing channels each connected to one of said sensors including a sense amplifier and detector for the electrical signal is produced by the respective sensor, and further including an individual multi-stage shift register with a plurality of binary storage stages for sequentially storing as binary data the electrical signals resulting from the sensing of the presence and absence of reflected echo signals from the parallel planar object regions, and means for serially connecting said individual shift registers for reading out the stored binary data,

means for supplying trains of pulses in parallel to selected components of said signal processing channels to effect sequential read-in and shifting of said binary data, and to effect read-out of said stored binary data before the launching of the next acoustic pulse, and

a memory for storage of the binary data read out of said serially connected individual shift registers.

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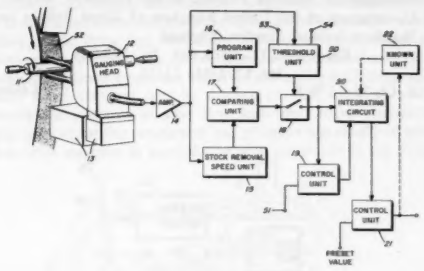
3,895,526

## METHOD FOR MEASURING THE CUTTING CAPACITY OF THE GRINDING WHEEL OF A GRINDER

Mario Pozzetti, Bologna, Italy, assignor to Finike Italiana Marposs, s.a.s., Bentivoglio, (BO), Italy

Filed May 31, 1973, Ser. No. 365,734
Claims priority, application Italy, June 15, 1972, 3459/72
Int. Cl. G01n 3/56
U.S. Cl. 73—104 5 Claims

1. A method for checking the cutting capacity of the grinding wheel of a grinder, comprising determining for every piece to be ground, at the end part of the relative machining cycle, the value of at least one quantity, representative of the flexion state and of the strains of the piece itself, combining the succeeding so determined values and comparing the value resulting from said combination with a reference value.

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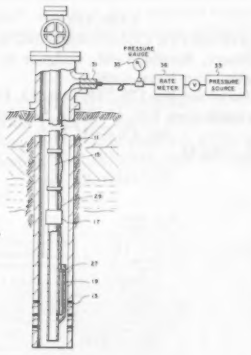
3,895,527

## METHOD AND APPARATUS FOR MEASURING PRESSURE RELATED PARAMETERS IN A BOREHOLE

Billy W. McArthur, Houston, Tex., assignor to Sperry-Sun Well Surveying Company, Sugar Land, Tex.

Filed Nov. 8, 1973, Ser. No. 414,060
Int. Cl. E21b 47/06
U.S. Cl. 73—151 7 Claims



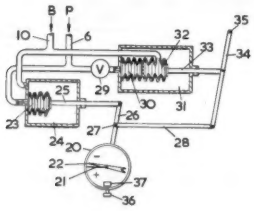

1. A system for detecting downhole pressure of formation fluids in a petroleum reservoir and for providing readings at the surface of such pressure, including a well pipe extending from the surface into the petroleum reservoir; a small diameter hollow tube attached to the outside of said pipe and extending from the surface to the bottom of the pipe; a check valve at the lower end of said tube, said check valve comprising a ball floatable in formation fluids, upper seating means to restrict upward movement of the ball, and lower seating means to restrict downward movement of said ball; surface means for applying fluid pressure to the upper end of the tube; and means at the surface for detecting the rate of change of fluid pressure in the tube as pressure is applied to the surface.

3,895,528

## AIRCRAFT INSTRUMENTATION DISPLAYS

John Royal Sturgeon, Farnborough, England, assignor to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sept. 21, 1973, Ser. No. 399,524
Int. Cl. G01c *21/10*
U.S. Cl. 73—178 R 5 Claims




1. An aircraft instrumentation display system having a source of pitot pressure and a source of static pressure comprising; means for combining the pitot and static pressures to provide a signal, representative of aircraft total energy, for use as an engine power director; a first instrument displaying said total energy signal; means for converting pitot pressure into a signal for use as an elevator director; and a second instrument displaying said pitot pressure signal, both of said instruments being mounted upon a common panel visible to the pilot of the aircraft.

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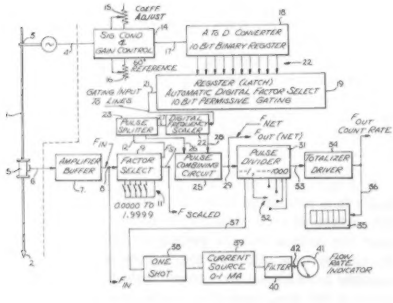
3,895,529

## FLOWMETER COMPENSATING SYSTEM

James E. Moore, Reseda, Calif., assignor to Waugh Control Corporation, Van Nuys, Calif.

Continuation of Ser. No. 179,755, Sept. 13, 1971, abandoned.
This application Feb. 11, 1974, Ser. No. 441,016
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 M 13 Claims




1. Apparatus for compensating a first measured parameter of a continuous process in accordance with measured changes in a second parameter of said process, comprising:

first transducer means for converting said first measured parameter into a series of discrete pulses;

pulse dividing means for receiving said series of discrete pulses and directing a first fraction of said pulses into a first signal channel, and directing the remaining fraction of said pulses into a second signal channel;

second transducer means for converting said second measured parameter into a corresponding analog signal,

analog-to-digital conversion means for converting said analog signal to a corresponding digital signal;

pulse multiplying means for multiplying the pulses in said first signal channel as a function of said digital signal to obtain a pulse output; and

combining means for combining the pulse output from said second signal channel with the pulse output of said pulse multiplying means.

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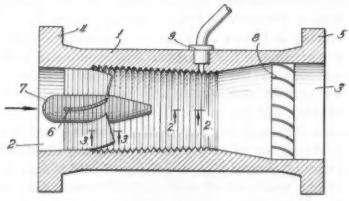
3,895,530

## TUBULAR SWIRL FLOW METER

Wolf Paetzold, Hochheim, Germany, assignor to Elster, AG, Mainz-Kastel, Germany

Filed May 16, 1974, Ser. No. 470,403
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 B 6 Claims

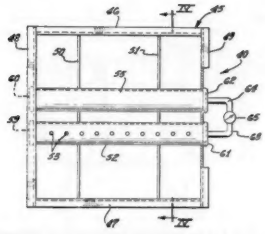



1. In a tubular swirl flow meter having a measuring tube, a swirl device at the entrance thereto and a measuring sensor downstream from the swirl device, the improvement wherein the internal surfaces of the measuring tube are rough, the roughened surfaces extending from the location of the swirl device within the measuring tube at least to the location of the measuring sensor, the ratio of the diameter of the tube to the depth of the roughness of the measuring tube surface being less than **300**, the elements forming the roughness being formed by spaced substantially circumferential grooves and having sharp profiles at their crests.

## 3,895,531
## APPARATUS FOR SENSING VOLUMETRIC RATE OF AIR FLOW

**Robert R. Lambert, 442 W. Leadora Ave., Glendora, Calif. 91740**

**Continuation-in-part of Ser. No. 706,058, Feb. 16, 1968, abandoned. This application Mar. 17, 1969, Ser. No. 814,498**
**Int. Cl. G01f** *1/00*
**U.S. Cl. 73—212** **6 Claims**



**1.** An apparatus for sensing volumetric rate of air flow comprising:

a total pressure sensing hollow tubular member having a series of axially spaced in-line openings facing the general direction of air flow,

a static air flow pressure sensing hollow tubular member having at least one series of axially spaced in-line openings facing normal to the direction of air flow,

means for supporting said total pressure sensing member and said static pressure sensing member in a plane transverse to the general direction of air flow and spaced from each other to form a nozzle therebetween, said openings in said static air flow pressure sensing hollow tubular member facing said total pressure sensing hollow tubular member to open towards said nozzle, and

means for measuring differential pressure in fluid communication with the total and static pressure sensing members so as to provide an indication of the velocity pressure.

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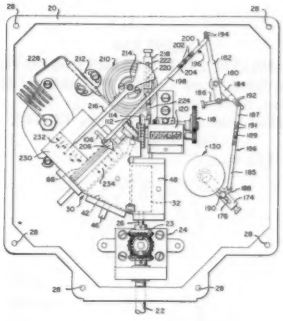
## 3,895,532
## PRESSURE AND TEMPERATURE COMPENSATED INDICATING APPARATUS FOR FLUID METERS

**Dirk C. Blakeslee, Verona, and Thomas C. Farrell, Glenshaw, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.**

**Filed Dec. 10, 1973, Ser. No. 423,212**
**Int. Cl. G01f** *1/08*
**U.S. Cl. 73—233** **2 Claims**

**1.** Apparatus for indicating the volume of fluid flow in a pipeline comprising means adapted to be driven by a fluid meter in a pipeline, a first drive element mounted for rotation about its axis, a second drive element mounted for rotation about its axis to one side of said first drive element and in side-by-side relation thereto, one of said drive elements being a cylinder and the other a cone, a third drive element mounted for rotation about its axis on the other side of said first drive element and in side-by-side relation thereto, one of said last two mentioned drive elements being a cone and the other a cylinder, the axes of rotation of said second and third drive elements being angularly disposed with respect to the axis of rotation of said first element whereby adjacent lengthwise portions of said first and second drive elements are spaced and parallel to each other and adjacent lengthwise portions of said first and third drive elements are spaced and parallel to each other, a first drive ring encircling said second element and in driving contact between said lengthwise portions of said first and second drive elements, a second drive ring encircling said third drive element and in driving contact between said lengthwise portions of said first and third drive elements, means to adjust the position of one of said rings axially of said first drive member in accordance with variations in the pressure of the fluid in said pipeline, means to adjust the position of the other of said rings axially of said first drive element in accordance with variations in the temperature of the fluid in said pipeline, means drive connecting said second drive element with said first mentioned means and means drive connecting said third drive element with indicating means adapted to indicate a cumulative total volume of fluid flow through said meter, said first drive element being a cylinder and said second and third drive elements being cones.



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## 3,895,533
## SUCKING MEASURE

**Moshe Steier, 67-66 108th St., Forest Hills, N.Y. 11375**

**Substitute for Ser. No. 155,475, June 22, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,819**
**Int. Cl. G01l** *7/08*
**U.S. Cl. 73—409** **3 Claims**

**1.** In a sucking measure, for measuring the sucking power of an infant, the combination of a baby bottle, a removable

cap upon said bottle, said cap having a rubber nipple upon a center thereof, said nipple having an opening therethrough providing an air communication with an interior of said bottle, said cap supporting means for measuring negative pressure within said bottle, said bottle having means for measuring a size of said supported means.

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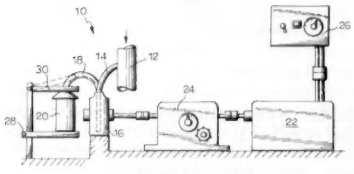
**3,895,534**

## AUTOMATIC LIQUID SAMPLING DEVISE

**Stanley Allan Stone, State College, Pa., assignor to Scientific Systems, Inc., State College, Pa.**

**Filed June 3, 1974, Ser. No. 476,110**
**Int. Cl. G01n *1/14***
**U.S. Cl. 73—422 R** **4 Claims**




1. An automatic milk sampling device for readily continuously extracting a proportional sample of milk from a supply being transferred to a milk truck and the like, said device synchronized to operate over the entire time period required for transfer to produce a predetermined sample volume comprising:

a variable speed motor;

a sample container;

pump means connected between a main milk loading conduit and said sample container for drawing a sample from said main milk loading conduit and storing the milk sample in said sample container, said pump means having a pump rate directly proportional to the rate of operation thereof, said variable speed motor being operatively coupled to said pump means for operation thereof at a rate proportional to the rate of operation of said variable speed motor; and

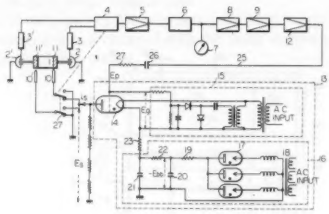
a motor speed control means coupled to said variable speed motor for controlling the rate of operation thereof, said motor speed control means adjustable to vary the rate of operation of said variable speed motor for driving said pump at a rate to collect a predetermined fixed sample volume over the time required for the milk transfer operation, said speed control means being calibrated to indicate the total amount of milk being transferred as estimated by an operator, the speed of said motor being correspondingly controlled, whereby the rate of operation of said pump means may be adjusted to collect a fixed amount of sample over the time period required for transferring the milk.

**3,895,535**

## METHOD AND APPARATUS FOR INDICATING THE UNBALANCED CONDITION OF A ROTATING BODY

**Yasuo Iijima, and Kenji Tanaka, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Filed Oct. 25, 1973, Ser. No. 409,742**
**Int. Cl. G01m *1/22, 1/26***
**U.S. Cl. 73—462** **3 Claims**




1. An apparatus for indicating imbalanced masses in a rotating body, comprising, means for rotating a body, means for detecting imbalance of said body and generating vibrations corresponding to the imbalance due to imbalanced masses on said body, means responsive to said vibrations for generating electrical signals corresponding to vibrations of said body due to said imbalanced masses, means for producing a train of pulses in response to said electrical signals having a frequency equal to said electrical signals, a circuit for producing surge currents comprising a thyratron, means comprising a pair of electrodes positioned spaced relative to the surface of said rotating body and defining a load impedance circuit in series with said thyratron, a time constant circuit connected in series with said thyratron for discharging electrical energy in correspondence with an air gap between said electrodes and the surface of said rotating body, a direct current source for charging said time constant circuit, means connecting the grid electrode of said thyratron to receive said train of pulses, whereby said time constant circuit is caused to repeatedly discharge its stored energy simultaneously with a predetermined number of said pulses and develop a spark from said electrodes to the surface of the rotating body marking the location of the masses thereof causing imbalance.

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**3,895,536**

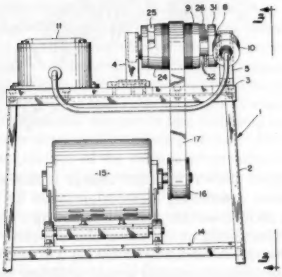
## APPARATUS FOR AND METHOD OF TESTING FOR PREDETERMINED UNBALANCE OF ELECTRIC MOTOR ROTORS AND THE LIKE

**Carl M. Behm, 27317 Santa Clara Dr., Westlake, Ohio 44145**

**Filed Sept. 9, 1974, Ser. No. 504,153**
**Int. Cl.[2] G01M *1/22***
**U.S. Cl. 73—462** **7 Claims**

1. A machine for dynamically testing tubular electric motor rotors of the like of the type having fixed and applied weights at its respective axial end portions angularly spaced apart 180°; said machine comprising a stand having coaxial bearing

support members; an arbor for non-rotatably mounting such rotor thereon between bearings on said arbor engaged in said bearing support members; drive means on said stand for driving said arbor and thus said rotor at predetermined angular velocity; said arbor having a heavy spot of selected oz. in. magnitude axially offset from and angularly spaced 180° from said applied weight to decrease the static unbalance of said rotor-arbor assembly to within a prescribed oz. in. limit in connection with a rotor which meets manufacturing specifications therefor and to substantially dynamically balance said



rotor-arbor assembly to within a prescribed oz. in.$^2$ limit when said rotor-arbor assembly is driven by said drive means; transducer means on one bearing support producing a signal proportional to the magnitude of dynamic unbalance responsive to the vibration of the associated bearing in said one bearing support; vibration monitor means operatively connected to said transducer means; and indicating means operatively connected to said monitor effective to indicate whether or not said rotor-arbor assembly is within such prescribed oz. in.$^2$ dynamic unbalance limit.

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**3,895,537**

**CENTRIFUGAL RPM REGULATOR FOR INTERNAL COMBUSTION ENGINES**

**Herbert Bechstein, Kennenburgerstr. 46/1, Esslingen; Hans-Jurgen Jaenke, Beutenfeldstr. 40, Ditzingen; Rolf Muller, Adalbert-Stifter-Str. 8, 7 Stuttgart-Freiberg; Ernst Ritter, Hattenbuhl, Stuttgart 30; Heinrich Staudt, Am Feldle 16, Markgroningen-Talhausen; Helmut Tomasch, Im Schlossgarten 3, Freiberg-Beihingen, and Alois Urlberger, Waldheimstr. 57, Ruit, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany**

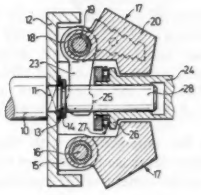
**Filed Dec. 11, 1973, Ser. No. 423,743**

**Claims priority, application Germany, Dec. 23, 1972, 2263382**

**Int. Cl. G05d** *13/14*

**U.S. Cl. 73—550** **10 Claims**

1. A centrifugal rpm regulator for internal combustion engines comprising, in combination:
   a. a centrifugal weight carrier;
   b. at least two angular centrifugal weights, each said centrifugal weight including:
      1. an angled lever having a first arm and a second arm, said first arm having at least a portion thereof of irregular shape,
      2. a bearing location, defined by a bearing bushing, in the region of connection of said first arm and said second arm serving to mount pivotally the respective said centrifugal weight to said centrifugal weight carrier, and



      3. an angular centrifugal mass, a portion of which surrounds said bearing bushing, fixedly connected to said first arm and surrounding at least that portion of said first arm having said irregular shape; and
   c. a regulating sleeve operatively positioned to be actuated by said second arm.

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**3,895,538**

**SLACK COMPENSATOR FOR BRAKE SYSTEMS**

**Donald T. McGregor, 8067 Monroe Ave., Stanton, Calif. 90680**

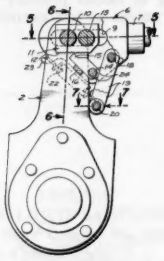
**Filed Nov. 22, 1974, Ser. No. 526,240**

**Int. Cl.$^2$ B60T** *11/08;* **G05G** *1/04*

**U.S. Cl. 74—518** **8 Claims**

1. A slack compensator adapted to be interposed between a brake lever having a journal pin and an operating shaft of a vehicle brake system, the slack compensator comprising:
   a. a clevis structure forming a drive connection between the operating shaft and the brake lever including slots for receiving the journal pin;
   b. a ratchet and pawl means, the ratchet means being movable with the journal pin and guided by the slots, the pawl means being pivotally attached to the clevis structure;
   c. thrust lever means pivotally connected to the clevis structure and engageable with the brake lever at an intermediate point between its pivotal axis and the ratchet means to reduce the effective length thereof; the thrust lever means also engageable with the pawl means to hold the pawl means clear of the ratchet means;
   d. and spring means initially fixing the thrust lever means against the brake lever to transmit a thrust from the operating shaft to the brake lever at said intermediate point thereby to cause increased rotation of the brake lever per unit of movement of the operating shaft;

e. the spring means being yieldable to a predetermined force exerted by the operating shaft through the thrust lever means against the brake lever to cause release of the



pawl means for engagement with the ratchet means thereby to cause decreased rotation of the brake lever per further unit of movement of the operating shaft.

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**3,895,539**

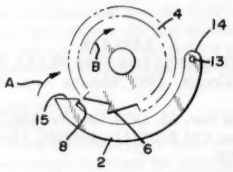
**LOCKING PAWL AND RATCHET WHEEL**

**Per Olaf Weman, Haslah, and Harald Martin Schmelow, Ellerau, Kries Segeberg, both of Germany, assignors to Sigmatex A.G., Switzerland**

**Filed Jan. 17, 1974, Ser. No. 434,320**

**Int. Cl. F16d** *41/12*

**U.S. Cl. 74—575** **8 Claims**



**1.** An improved locking pawl adapted for use with a wheel having ratchet teeth, said pawl comprising: a locking surface for engagement with a ratchet tooth, said locking surface being substantially perpendicular to a tangent of said ratchet wheel at said ratchet tooth; a sensing tip for sensing the position of said ratchet tooth to be engaged by said locking surface; and a pivoting point on which said locking pawl pivots for engagement with said ratchet wheel; wherein said locking pawl has a substantially arcuate shape in the range of approximately 135° to 180°, said arcuate shape having an interior arc and an exterior arc, said interior arc being disposed closer to said ratchet wheel than said exterior arc; an engaging end which engages said ratchet tooth of said wheel and a pivoting end on which said locking pawl pivots; said sensing tip and said locking surface of said locking pawl being disposed on said engaging end of said locking pawl and being disposed on the interior arc of said locking pawl.

**3,895,540**

**SPEED AND/OR DIRECTION CHANGE MEANS**

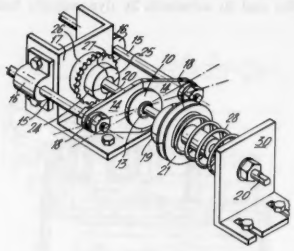
**Robert Davidson, Hadlow, No. 4 R.D., Timaru, New Zealand**

**Filed Dec. 26, 1973, Ser. No. 427,556**

**Claims priority, application New Zealand, Dec. 27, 1972, 167927**

**Int. Cl. F16h** *1/34, 23/00;* **F16j** *15/52*

**U.S. Cl. 74—800** **15 Claims**



**1.** A speed and/or direction change means comprising, in combination, a wobbling member arranged for orderly cyclic wobbling about a wobble center and having a contact surface, means for imparting an orderly cyclic wobbling motion to the wobbling member, and a rotor having a contact surface, said rotor being rotatable relative to said wobbling member so that, under the orderly cyclic wobbling of said wobbling member, the contact surface of the rotor is progressively engaged by the contact surface of said wobbling member at a circularly moving locus of contact, said wobble center lying in the axis of rotation of said rotor relative to said wobbling member, said imparting means comprising a shaft passing through the wobble center, and bearing means surrounding said shaft and wobble center, said bearing means slidably mounting said wobbling member for movement towards and away from the rotor along the axis of rotation of the rotor relative to the wobbling member.

**5.** A speed and/or direction change means comprising, in combination, a wobbling member arranged for orderly cyclic wobbling about a wobble center and having a contact surface, means for imparting an orderly cyclic wobbling motion to the wobbling member, and a first rotor having a contact surface, said rotor being rotatable relative to said wobbling member so that, under the orderly cyclic wobbling of said wobbling member the contact surface of the rotor is progressively engaged by the contact surface of said wobbling member at a circularly moving locus of contact, said wobble center lying on the axis of rotation of said rotor relative to said wobbling member, and at least one of said contact surfaces is a frustum of a cone having its vertex at the wobble center.

**6.** A speed and/or direction change means comprising, in combination, a wobbling member arranged for orderly cyclic wobbling about a wobble center and having a contact surface, means for imparting an orderly cyclic wobbling motion to the wobbling member, and a first rotor having a contact surface, said rotor being rotatable relative to said wobbling member so that, under said orderly cyclic wobbling of the wobbling member, the contact surface of the rotor is progressively engaged by the contact surface of said wobbling member at a circularly moving locus of contact, said contact surface of said rotor being a continuous, convex surface and consisting of a frictional-drive material for contact with said contact surface of said wobbler to thereby drive said rotor in nonsliding contact.

**11.** A speed and/or direction change means comprising, in combination, a wobbling member adapted for orderly cyclic wobbling about a wobble center and having a contact surface, means for imparting an orderly cyclic wobbling motion to the wobbling member, and a first rotor having a contact surface, said rotor being rotatable relative to said wobbling member so that, under said orderly cyclic wobbling of the wobbling mem-

ber, the contact surface of the rotor is progressively engaged by the contact surface of said wobbling member at a circularly moving locus of contact, wherein each of said contact surfaces comprises a plurality of contacting portions arranged such that, during orderly cyclic wobbling of said wobbling member, said contacting portions of said rotor are progressively engaged by the contacting portions of said wobbling member at a zone of contact describing a circle on each of said contact surfaces, said wobble center lying on the axis of rotation of said rotor relative to said wobbling member, said means for imparting an orderly cyclic wobbling comprising stud means extending outwardly from said wobbling member on the wobble plane, said stud means slidably engaging a body for fixing said wobbling member against rotation relative to said body, said imparting means also comprising driving means operatively connected to said stud means to reciprocate said stud means and wobble said wobbling member.

13. A speed and/or direction change means comprising, in combination, a wobbling member adapted for orderly cyclic wobbling about a wobble center and having a contact surface, means for imparting an orderly cyclic wobbling motion to the wobbling member, and a first rotor having a contact surface, said rotor being rotatable relative to said wobbling member so that, under said orderly cyclic wobbling of the wobbling member, the contact surface of the rotor is progressively engaged by the contact surface of said wobbling member at a circularly moving locus of contact, futher comprising a second rotor having a contact surface in direct engagement with a contact surface of said wobbling member, said rotor being coaxially mounted with said first rotor and lying at the opposite side of said wobbling member from said first rotor, said second rotor rotatable about the same axis as said first rotor, first means for rotatably mounting said first rotor, and second means for rotatable mounting said second rotor, said second means allowing rotation of said second rotor at a speed different from that of said first rotor.

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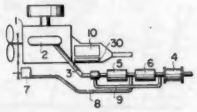
## 3,895,541
## CONTROL SYSTEM FOR MOTOR VEHICLE WITH CATALYTIC CONVERTOR AND AUTOMATIC POWER TRANSMISSION MECHANISM

**Hidetaka Nohira, Susono, and Shin Ito, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan**

**Filed June 15, 1973, Ser. No. 370,207**
**Claims priority, application Japan, June 26, 1972, 47-63190**
**Int. Cl. B60k** *23/00;* **F16h** *3/74*
**U.S. Cl. 74—844** **7 Claims**




1. In a motor vehicle including an engine, an automatic power transmission mechanism for transmitting power from said engine to drive said vehicle, an engine exhaust gas system having a catalytic convertor including a catalyst for purifying exhaust gases from said engine, and an oil pressure system for controlling operation of said automatic transmission mechanism to selectively provide a plurality of forward driving speed ratios, the improvement consisting of a control system for expediting temperature rise of said catalyst, said control system comprising;

shift means operatively associated with said oil pressure system for effecting shift control operation of said transmission mechanism from a lower to a higher driving speed ratio;

sensing means connected for sensing temperature indicative of the temperature of exhaust gases within said catalytic convertor;

delay means responsive to said sensing means and connected to control said shift means in accordance with the temperature of said exhaust gases in said catalytic converter to prevent operation thereof to shift said transmission from said lower to said higher driving speed ratio when the temperature sensed by said sensing means indicates a catalyst temperature below a predetermined level; whereby upshift of said transmission to said higher driving speed ratio is delayed until said predetermined temperature level is reached.

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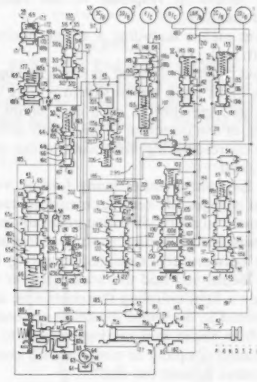
## 3,895,542
## SHIFT POINT STABILIZING HYDRAULIC CONTROL CIRCUIT FOR AUTOMATIC TRANSMISSION

**Toshiyuki Miyauchi, Yokohama, Japan, assignor to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan**

**Filed Oct. 3, 1973, Ser. No. 403,305**
**Claims priority, application Japan, Oct. 6, 1972, 47-100494**
**Int. Cl. B60k** *21/02*
**U.S. Cl. 74—868** **8 Claims**



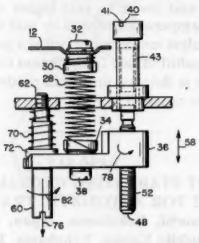
1. In a hydraulic control circuit for a vehicle automatic transmission of the type wherein a plurality of shift control valves selectively deliver hydraulic fluid to a plurality of frictional elements to cause engagement and disengagement of said frictional elements having a first pressure regulating means and a throttle valve responsive to the vehicle engine load interposed between a main supply pump and the shift control valves, the improvements comprising: a second pressure regulating means interposed between the first pressure regulating means and at least one shift control valve and means to control the second pressure regulating means independently of the first pressure regulating means.

7. The improved hydraulic control circuit of claim 1 wherein the second pressure regulating means regulates the pressure supplied to the at least one shift control valve only when a manual gear selection valve is in a position which permits the transmission to automatically shift into its highest forward gear.

## 3,895,543
## ADJUSTMENT MECHANISM

Paul T. Metzger, and Wayne D. Mitchell, both of Rochester, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,521
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 4 Claims



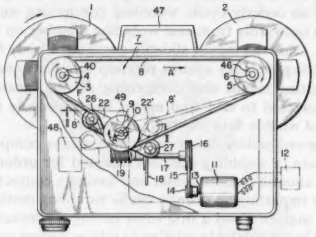
1. An adjustment mechanism comprising:
a rotatable threaded member;
carriage means, including a threaded portion, coupled to said threaded member for movement in response to the rotation of the threaded member;
guide means including a shaft extending generally parallel to said threaded member and through an aperture formed in said carriage means for preventing the rotation of said carriage means in response to the rotation of said threaded member;
said resilient means including a spring positioned around said shaft; and
wherein said aperture formed in said carriage means is in the form of an open ended slot providing a forked end, one forcated member of such end having a dimension extending in the direction of said shaft substantially less than the corresponding dimension of the other forcated member, and
said other forcated member being formed with a beveled edge that engages the resilient means to cause a force to be generated in a first direction generally parallel to said shaft forwards said carriage to apply a continuous twisting moment between the threaded coupling between said carriage means and said threaded member in a direction to provide a tight coupling therebetween, and a force to be generated in a second direction generally normal to said shaft to cause said carriage means to rotate about said threaded coupling to continuously engage a side of the aperature against the shaft.

## 3,895,544
## POWER TRANSMISSION DEVICE BETWEEN A PLURAL NUMBER OF ROTORS OF CINEPROJECTORS

Kuniyoshi Suzaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,762
Claims priority, application Japan, June 29, 1972, 47-65360
Int. Cl. F16h 7/08, 7/12
U.S. Cl. 74—242.15 R 16 Claims

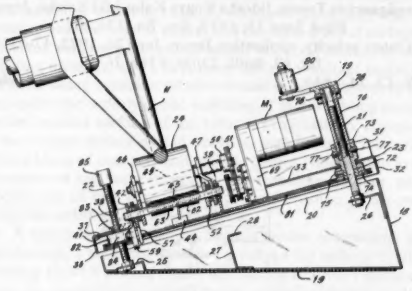
1. A power transmission device for a motionpicture projector, and the like comprising in combination:
a take-up reel spindle (6) which is rotatable to take part in film winding;
a supply reel spindle (4) which is rotatable to take part in film feeding;
driving means for operating said projector, said driving means having a driving shaft (9) which is rotated by the driving force of said driving means;
a first pulley (9) which is coupled directly to said driving shaft and rotates integrally therewith;
a second pulley which constantly rotates integrally with said take-up reel spindle;
a third pulley (3) which constantly rotates integrally with said supply reel spindle;
an endless band-form body (8) stretched between said first, second, and third pulleys in a manner to be friction-engaged with said respective pulleys, said endless band-form body receiving the driving force of said driving means through said first pulley when said driving means is driven, and transmitting said driving force to said second and third pulleys; and
a band-form body adjusting means having a relation to respond to the directions and magnitude of the driving force of said endless band-form body caused by said first pulley, said adjusting means eliminating slack produced in the band-form body adjacent said first pulley which is driven by said driving shaft.



## 3,895,545
## STEERING WHEEL TURNING DEVICE

Lee Hunter, 13501 Ladue Rd., Ladue, Mo. 63141

Filed Jan. 2, 1974, Ser. No. 429,506
Int. Cl.[2] B62D 1/24
U.S. Cl. 74—494 7 Claims

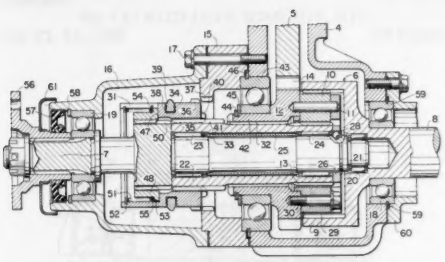


1. A vehicle steering wheel turning device comprising a pair of steering wheel engaging members, means operably carrying said pair of steering wheel engaging members in position to move into steering wheel engagement at spaced points of contact, said carrying means comprising a base and a platform, a plurality of screw posts fixed in said base at spaced positions, cooperating rotary nuts engaged in said platform and riding on said posts, a drive member engaged on each rotary nut, common drive means engaged with said drive members to rotate said nuts in unison and effect movement of said platform relative to said base, and reversible motor means operably connected to both of said steering wheel engaging members to rotate said members simultaneously and in the same direction.

## 3,895,546
## TRANSFER TRANSMISSION MECHANISM

**Hiroji Yamaguchi, 50-4 chome, Oyama-cho, Kariya, Aichi Prefecture, and Tunehiko Ogasahara, 14-2 Takabe, Chiryu, Aichi Prefecture, both of Japan**

**Filed Apr. 23, 1973, Ser. No. 353,611**
**Claims priority, application Japan, Apr. 27, 1972, 47-43162**
**Int. Cl. F16h** *37/08*
**U.S. Cl. 74—695** **5 Claims**



1. In a transfer mechanism for use in a motor vehicle assembly having a source of power and a pair of first and second driven axles aligned with each other, said transfer mechanism including: a three-element planetary gear train consisting of a sun gear, a carrier with at least one pinion gear thereon in mesh with said sun gear and an internal ring gear in mesh with said pinion gear; means connecting one of said three elements in driving relation with said source of power; a second of said three elements being integrally connected with said first driven axle for rotation therewith; a stationary member mounted on a stationary portion of the vehicle and control means for selectively engaging the remaining one of said three elements with said stationary member, said second driven axle, or both said second driven axle and said first one of said three elements, such that said three element planetary gear can be actuated as a differential gear as well as a speed change gear with one of said driven axles isolated from said source of power.

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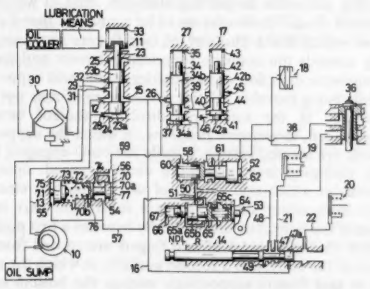
## 3,895,547
## TRANSMISSION CONTROL SYSTEM

**Noboru Murakami, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan**

**Filed July 25, 1974, Ser. No. 491,681**
**Claims priority, application Japan, July 25, 1973, 48-83194**
**Int. Cl. B60k** *21/12*
**U.S. Cl. 74—867** **5 Claims**




1. A transmission control system for a vehicle, comprising:
a hydraulic fluid pressure source;
fluid pressure regulator means for regulating the pressure of said hydraulic fluid from said fluid pressure source to a particular line pressure;
a plurality of frictional engaging means actuated by said line pressure from said fluid pressure regulator means for attaining a particular gear ratio within the gear trains of said transmission;
a governor valve for generating a governor pressure which is increased or decreased in response to the speed of said vehicle;
a manual shift valve operatively connected to said fluid pressure regulator means for selectively supplying said line pressure to either of said plurality of frictional engaging means;
a throttle valve fluidically connected to said manual shift valve for generating a throttle pressure reponsive to the degree to which the engine throttle valve is opened;
a shift valve fluidically connected to said manual shift valve and actuated in response to said governor pressure and said throttle pressure for automatically selectively actuating said plurality of frictional engaging means;
a hydraulic conduit for connecting said throttle valve to said shift valve; and
a modulator valve disposed within said hydraulic conduit and actuated in response to said throttle pressure,
whereby said throttle valve and said shift valve are fluidically communicated with each other in order to supply said throttle pressure directly to said shift valve when said throttle pressure is below a predetermined value, and to supply said throttle pressure to said shift valve with a different rate of increase when said throttle pressure is above said predetermined value.

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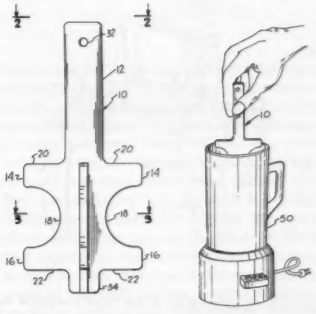
## 3,895,548
## BLENDER PACKING DEVICE

**Delsford B. Sauve, Ft. Lauderdale, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest**

**Filed July 29, 1974, Ser. No. 492,582**
**Int. Cl. A47j** *43/28*
**U.S. Cl. 81—1 R** **9 Claims**



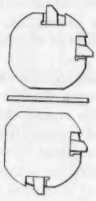
1. A tool for use in packing a blender which comprises an elongated flat handle member, a first generally planar elongated blade integrally formed with said handle member and having a plurality of transversely extending fins, a second generally planar elongated blade fixedly carried at right angles to said first generally planar elongated blade and having a plurality of transversely extending fins whereby said first and second blades cooperate to urge foodstuffs into a blender.

3,895,549

## APPARATUS FOR SHEARING OF STEEL STRIP END IN HOT FINISH ROLLING

Akira Noda, Nagoya; Atsuhiro Wakako, Handa; Tadashi Kodashima, and Akio Tanaka, both of Tokai, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed June 13, 1973, Ser. No. 369,421
Int. Cl. B26d 1/40
U.S. Cl. 83—345 1 Claim



1. An apparatus for shearing end portions of strip steel in a hot finish rolling comprising an upper drum, a lower drum mounted parallel with said upper drum so as to form a pass line therebetween for the strip steel, each of said drums having on its periphery only two knives, a first knife for front end shearing, and a second knife for rear end shearing, said first knife lying at a lag angle measured in the direction of shearing rotation from said second knife in the range of 60° 150°, and means for rotating said drums in opposite direction relative to one another, the periphery of said drums from said first knife to said second knife in a direction opposite to that for said lag angle being continuous and uninterrupted.

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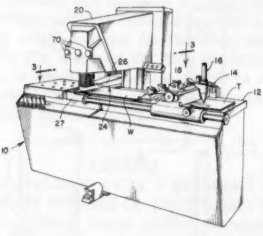
3,895,550

## EXTENDABLE ARM PUNCHING APPARATUS

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., Seattle, Wash.

Continuation-in-part of Ser. No. 445,487, Feb. 25, 1974, abandoned. This application June 5, 1974, Ser. No. 476,375
Int. Cl. B26f 1/04
U.S. Cl. 83—409 8 Claims



1. In a punching apparatus of the type having a work sheet supporting table, work sheet clamps for holding a work sheet on the table, means for moving the work sheet clamps over the table, and a tool holder having an upper arm provided with a punch and a lower arm provided with a die and movable for positioning said punch and die beneath a striker, the improvement comprising: a second smaller punch and die spaced from said first punch and die on said upper and lower arms in the direction toward said work sheet clamps, and

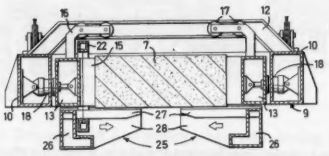
means for moving said tool holder longitudinally and laterally for positioning said second punch and die beneath said striker whereby a plurality of tools may be employed to punch said work sheet.

3,895,551

## COMBINED LIFTING AND CUTTING MEANS FOR UNHARDENED CELLULAR CONCRETE BODIES

Rolf Erik Göransson, Akarp, Sweden, assignor to Siporex-Francais S.A.R.L., Paris, France

Filed July 8, 1974, Ser. No. 486,726
Claims priority, application Sweden, July 11, 1973, 7309756
Int. Cl. B28b 11/14
U.S. Cl. 83—453 6 Claims



1. A device for gripping and transferring a substantially parallelepipedic, still unhardened cellular concrete body from a first to a second support and for simultaneously cutting the body in the transverse direction thereof, said device comprising, for the first, a horizontal and generally rectangular carrier frame that is supported in a manner permitting at least vertical movement thereof, is large enough to encircle the body, and is provided on the inner sides of its longitudinal side members with clamping jaws adapted to be pressed against the longitudinal side surfaces of the body and having its body-engaging faces divided into a plurality of sections separated by vertical slots; for the second, a vertical cutting frame that extends in the longitudinal direction of said carrier frame, is guided to move in the transverse direction of the latter between opposite end positions located outside the body-engaging faces of the clamping jaws, and has a number of vertically extending cutting members stretched therein in a manner to enter corresponding slots in the clamping jaws, when the cutting frame is in its end positions; and, for the third, on the lower side of said carrier frame, two transversally spaced and longitudinally extending comb-like supporting elements, both of which are connected to said carrier frame to be supported thereby and each of which has a plurality of free fingers projecting inwardly towards the opposite supporting element and thus in the transverse direction of said carrier frame, said supporting elements being movable relative to the carrier frame not only horizontally in the transverse direction thereof between widely spaced, inoperative positions, in which the supporting elements are located entirely outside the body-engaging faces of the clamping jaws, and more closely spaced, operative positions, in which said fingers of said supporting elements extend from either side in under a substantial part of the bottom of the body, but also vertically between a first position, in which the upper sides of said fingers are spaced from the bottom of the body, and a second position, in which the upper sides of said fingers supportingly engage the bottom of the body, said supporting elements being adapted to carry the entire weight of the body all by themselves during the transverse cutting operation.

## 3,895,552
## EXPLOSIVE TYPE SEVERING DEVICE FOR CABLES, RODS AND THE LIKE

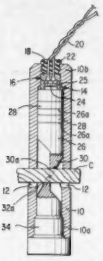
Guy Jean Lagofun, Tarbes, France, assignor to Etat Francais, Paris, France

Continuation-in-part of Ser. No. 358,407, May 8, 1973, Pat. No. 3,873,786. This application Jan. 14, 1974, Ser. No. 433,301

Claims priority, application France, Jan. 11, 1973, 73.00809

Int. Cl.[2] B23D *15/14*; B26D *3/16, 5/12*

U.S. Cl. 83—580 10 Claims




1. A device for severing an element such as cable, rod or the like using shear forces generated by gas pressures resulting from the explosion of explosive charge having a useful energy per unit mass of greater than 1000 joules per gram and a detonation speed of greater than 3000 ms., said device comprising a housing defining a recess in which said charge is housed and which opens on a surface delimited by a movable piston that engages the element to be severed, the initial volume presented to the explosion gases, defined by the explosive charge and the recess in which said charge is housed, being no greater than the volume swept by the gas during the useful movement of the severed portion of the element to be severed, said movable piston being located within a chamber and being movable longitudinally therein, and said piston including a knife end which, in the rest position of the piston prior to the severing operation, contacts and bears against the element to be severed.

## 3,895,553
## SAMPLING MODULATION SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

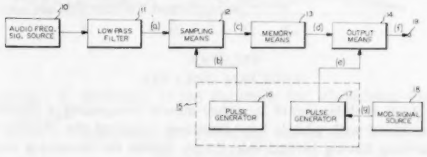
Kinji Kawamoto, Hashimoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 330,649, Feb. 8, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,920

Claims priority, application Japan, Feb. 10, 1972, 47-14583; July 7, 1972, 47-68430; July 10, 1972, 47-69330; July 20, 1972, 47-73189; Oct. 19, 1972, 47-105098; Nov. 1, 1972, 47-109657

Int. Cl. G01h *1/02*

U.S. Cl. 84—1.24 28 Claims




1. A sampling modulation system comprising:
an audio frequency signal source representing music;
a sampling means connected to said audio frequency signal source for sampling an audio frequency signal from said audio frequency signal source so as to produce sample signals, respective ones of which represent instantaneous amplitudes of said audio frequency signal;
a memory means coupled with said sampling means for memorizing said sample signals supplied thereto one by one from said sampling means;
an output means coupled with said memory means for reading out said sample signals memorized in said memory means one by one;
a controlling means coupled at least to said sampling means and to said output means and comprising a pulse generator which generates a sampling pulse train and a reading pulse train, both of said pulse trains having a frequency higher than twice the aduio frequency, said sampling pulse train being applied to said sampling means, and said reading pulse train being applied to said output means; and
a modulating signal source coupled to said controlling means for generating a modulating signal which has a sub-audio frequency, said modulating signal being applied to said pulse generator and frequency modulating at least one of said sampling pulse train and said reading pulse train for producing a periodical difference between the sampling of said audio frequency signal and the reading of said sample signals.

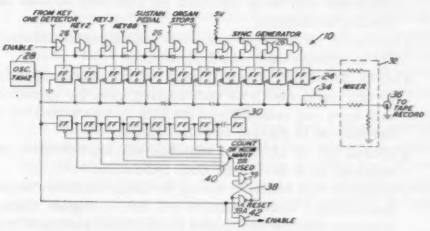
## 3,895,554
## TAPE ACTIVATED KEYBOARD-TYPE INSTRUMENTS

Joseph Maillet, 362 S. Third St., Hammonton, N.J. 08037

Filed July 10, 1974, Ser. No. 486,967

Int. Cl. G10f *5/00*

U.S. Cl. 84—115 10 Claims

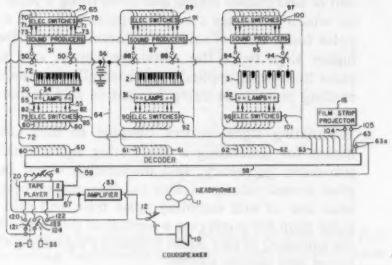



1. An apparatus for recording and reproducing music on a keyboard instrument comprising a keyboard having a plurality of keys, each key having an actuating means, an electrical shift register comprising a series of stages, the actuating means of each key on said keyboard being coupled to a corresponding stage in said shift register through a corresponding keyboard signal gate, each actuating means being adapted upon depression of the corresponding key, to send a key pulse to the corresponding stage of said shift register through the corresponding keyboard signal gate, an electrical oscillator coupled to said shift register to send clock pulses through said shift register to shift signals from said keyboard signal gates from stage to stage of said shift register, a terminal group of stages coupled to each other in said shift register for generating a sync group signal, a mixer stage coupled both to said terminal group to receive key pulses therefrom and to said oscillator for receiving clock pulses therefrom, said mixer stage being coupled to a recording tape which records signals from said mixer stage, a binary counter coupled to said oscillator to receive clock pulses therefrom and having its output coupled to a latch means, said latch means comprising a pair of cross-coupled inverter signal gates, said latch means being adapted to reset said binary counter upon reception therefrom of a clock pulse, said latch means also being coupled to the keyboard signal gates to generate an enabling signal to control the gating of information into the shift register.

## 3,895,555
## TEACHING INSTRUMENT FOR KEYBOARD MUSIC INSTRUCTION

**Richard H. Peterson, 11748 Walnut Ridge Dr., and Robert A. Finch, 12219 S. 89th Ave., both of Palos Park, Ill. 60464**

**Filed Oct. 3, 1973, Ser. No. 403,260**
**Int. Cl. G09b** *15/00*
**U.S. Cl. 84—470** **5 Claims**



1. A teaching instrument for music instruction wherein a student is provided with preprogrammed audio instructions accompanied by activation of sound producers, indicator lamps, or both, to illustrate the audio instructions, comprising;
a set of electrically operated sound producers for a musical instrument;
a set of playing keys connected to corresponding sound producers and being operable by a student to play said musical instrument;
a first set of electrical switches corresponding to and operable to activate said sound producers;
a set of electrically operated lamp indicators corresponding to and associated with said playing keys for identifying said keys and indicating operations to be carried out by the student in playing said instrument;
a second set of electrical switches corresponding to and operable to activate said lamp indicators,
a magnetic tape recorder having an audio channel carrying prerecorded audio instructions and a digital channel carrying prerecorded digital signals, said channels being simultaneously operable to produce synchronized audio instructions and digital signals, respectively;
decoding means connecting said digital channel through said first set of switches to said electrically operated sound reproducers and through said second set of switches to said electrically operated lamp indicators and responsive to digital signals in said digital channel to selectively activate said sound reproducers and corresponding lamp indicators;
speed control means connected to said recorder for selectively increasing and decreasing the speed thereof to permit variation in the pace of instruction; and
additional decoding means responsive to digital signals in said digital channel for selectively activating and deactivating said first and second sets of switches whereby said sets of sound producers and lamp indicators may be selectively activated for instructing a student.

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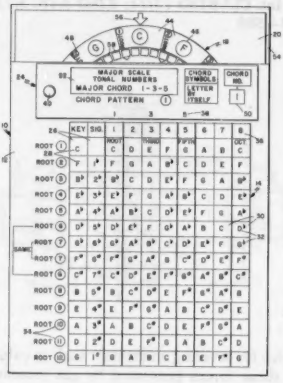
## 3,895,556
## CHORD PATTERN ANALYSER

**Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93721**

**Filed Feb. 22, 1974, Ser. No. 444,895The portion of the term of this patent subsequent to Apr. 24, 1990, has been disclaimed.**
**Int. Cl. G09b** *15/02*
**U.S. Cl. 84—471** **5 Claims**

1. A chord analyser, comprising:
a support including a display chart panel with tabulated indicia in columns therein plotting the scale tones for the different key signatures in relation to the scale degrees;
a plurality of strips selectively mountable on said base in conjunction with said indicia plotting the scale degrees;



said strips having thereon means to point out particular combinations of columns with half-tone raising and lowering indicators for particular chords enabling the reading of the chart to determine the scale tones for said particular chords in the different key signatures.

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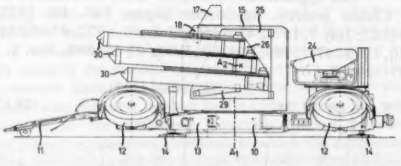
## 3,895,557
## ROCKET LAUNCHER MOUNT

**Emil Baumann, Niederglatt, Switzerland, assignor to Contraves AG, Zurich, Switzerland**

**Filed Nov. 23, 1973, Ser. No. 418,616**
**Claims priority, application Switzerland, Dec. 4, 1972, 17614/72**
**Int. Cl. F41f** *3/04*
**U.S. Cl. 89—1.815** **10 Claims**



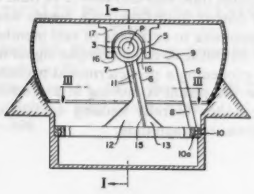
1. A mobile rocket launcher mount comprising a chassis equipped with wheels for permitting travel of the chassis, a housing having pivotal side doors, means for mounting said side doors for pivotable movement about substantially vertically extending hinge axes at the housing, a respective rocket launcher for accomodating a plurality of rockets mounted at each side door for pivotable movement about a respective horizontal pivot axis.

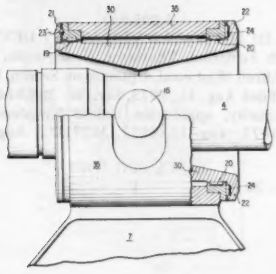
## 3,895,558
## SUPPORT SYSTEM

**Rudolf Schöps, Witzenhausen, Germany, assignor to Rheinstahl Aktiengesellschaft, Essen, Germany**

**Continuation-in-part of Ser. No. 37,498, June 16, 1969, abandoned. This application Feb. 2, 1973, Ser. No. 329,164**
**Claims priority, application Germany, June 14, 1968, 1703595**

**Int. Cl.[2] F41F** *21/06;* **F41H** *7/02*
**U.S. Cl. 89—36 K** **16 Claims**





**1.** In an armored vehicle comprising a vehicle body, a turret containing a gun, and means for mounting the turret and the gun on said body for simultaneous movement in a three-dimensional coordinate system about three-mutually perpendicular axes, the improvement wherein said means includes: an azimuth bearing mounted in said body below said turret; an elevation bearing for said gun and said turret; a tilt bearing, said elevation bearing being connected to said tilt bearing with said elevation and tilt bearings being disposed at approximately the center of said turret along the vertical axis of rotation of said azimuth bearing; and means for rigidly supporting said tilt bearing on said azimuth bearing including a substantially triangularly shaped carrier rigidly connected between the inner ring of said azimuth bearing and said tilt bearing, and extending in the longitudinal direction of said gun; and, at least one brace extending laterally to said carrier and connected rigidly between the inner ring of said azimuth bearing and said tilt bearing.

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## 3,895,559
## MILLING MACHINE

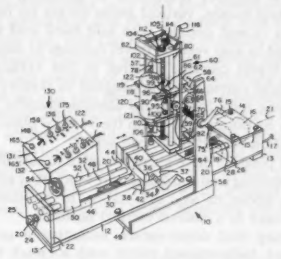
**Robert E. Hoffman, 10290 Farallone Dr., Cupertino, Calif. 95014**

**Filed Mar. 21, 1973, Ser. No. 343,507**
**Int. Cl.[2] B23C** *1/06*
**U.S. Cl. 90—14** **3 Claims**

**1.** A milling machine comprising in combination:

a base structure for supporting a work piece to be milled and a cutting tool to mill said work piece;

a pair of brackets extending vertically from said base structure and laterally spaced from one another, a first threaded lead screw engaged about one terminal end to one of said brackets and about the other terminal end to said other bracket, said first lead screw being supported in a horizontal plane and rotatable about its axis of rotation;



a horizontal travel carriage having an aperture coaxial with said first lead screw, the interior walls about said aperture being threaded with the threads of said first lead screw coupled with the threads about said aperture of said horizontal carriage, horizontal guide means on opposite lateral sides of and parallel with said lead screw and engaged to said horizontal travel carriage to support the horizontal travel carriage relative to said horizontal plane, said horizontal carriage being adapted to receive and secure a work piece thereto whereby said work piece may be positioned within a horizontal plane responsive to rotation of said first lead screw;

a first position drive means including a first variable speed, bidirectional motor coupled to said first lead screw about one of said terminal ends for driving said first lead screw in either rotational direction about its axis of rotation and to in turn drive the horizontal travel carriage in said horizontal plane along said guide means;

a pair of vertically extending support columns astraddle said first lead screw, at least one lateral support guide extending laterally intermediate of and engaged to said pair of support columns at an elevated position relative to said first lead screw, a second threaded lead screw engaged about one terminal end to one of said columns and about the other terminal end to said other column, said second lead screw being supported within a lateral plane and rotatable about its axis of rotation;

a lateral travel carriage having an aperture coaxial with said second lead screw, the interior walls about said aperture being threaded with the threads of said second lead screw coupled with the threads about said aperture of said lateral carriage, said lateral carriage being adapted to support a support base in an elevated vertical plane, and said lateral travel carriage being engaged to said lateral support guide to support the lateral travel carriage relative to said vertical plane;

a second position drive means to said second lead screw for driving said second lead screw in either rotational direction about its axis of rotation to position said lateral carriage in a desired lateral position within said vertical plane;

a pair of spaced-apart support brackets extending from said lateral travel carriage and vertically spaced relative to one another, a third threaded lead screw engaged about one terminal end to one of said spaced-apart brackets and

about the other terminal end to said other spaced-apart bracket, said third lead screw being supported in a vertical plane and rotatable about its axis of rotation;

a vertical travel carriage having a releasable split-nut assembly, said split-nut assembly including a pair of U-shaped internally threaded members positioned face-to-face about said third lead screw and a release control means for coupling each of said members about said third lead screw or releasing said members about said third lead screw member responsive to actuation of said release control means, vertical guide means on opposite lateral sides of and parallel with said third lead screw and engaged to said vertical travel carriage to support the vertical travel carriage relative to the vertical plane, said vertical carriage being adapted to receive and secure a cutting tool drive means thereto whereby a cutting tool may be positioned within the vertical plane responsive to rotation of said third lead screw;

a third position drive means coupled to said third lead screw for driving said third lead screw in either rotational direction about its axis of rotation to position said vertical carriage in a desired vertical position;

a cutting tool drive means including a second variable speed, bidirectional motor with a chuck for engaging a cutting tool and supporting said cutting tool in a vertical plane; and

an electronic control network having a power input terminal means for receiving electrical power, the network including a first control circuit extending intermediate said input terminal means and said first motor to control the electrical excitation to said first motor and a second control circuit extending intermediate said input terminal means and said second motor to control the electrical excitation to said second motor, said control network including manual control means positioned in a control console to permit said first and second motors to be controlled responsive to manual commands.

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**3,895,560**

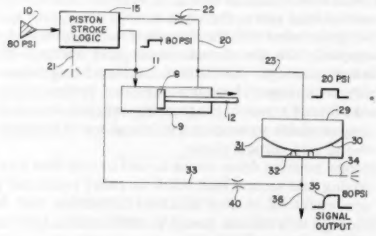
## CYLINDER MOTION SENSING

**Ernest David Anderson, Narragansett, R.I., assignor to Leesona Corporation, Warwick, R.I.**

**Filed Nov. 12, 1973, Ser. No. 414,689**

**Int. Cl.[2] F01B** *25/26, 31/12*

**U.S. Cl. 91—1** **8 Claims**




1. Apparatus for sensing the motion of a fluid operated piston within a cylinder, comprising in combination, a source of fluid under pressure, means gating said fluid to produce movement of said piston within said cylinder, a flow channel conveying exhaust fluid forced from the cylinder by movement of said piston, a fluid logic switching element having two fluid reception chambers and being responsive to pressure differential between two fluid pressures at said two chambers to switch a member from one condition to another, flow channel means coupling one said chamber to said source, means coupling the other said chamber to said flow channel conveying exhaust fluid, and means including said member in said switching element responsive to the differential pressure between said exhaust fluid and said source of fluid to switch said member, and output fluid flow path means coupled to said source and responsive to switching of said member to produce thereby at an output lead a fluid output signal in response to exhaust fluid exceeding a predetermined pressure magnitude indicating that the piston is moving at a predetermined rate within said cylinder thereby causing said exhaust fluid to exceed said pressure magnitude.

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**3,895,561**

## FLUID ACTIVATED VIBRATORY DEVICE

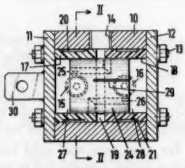
**Jan Frederik Felderhof, Voorburg, Netherlands, and James William Alfred Westwood, Upton upon Severn, England**

**Filed Aug. 16, 1973, Ser. No. 388,914**

**Claims priority, application United Kingdom, Aug. 19, 1972, 38770/72; Aug. 19, 1972, 38771/72; Aug. 22, 1972, 38998/72**

**Int. Cl. F01l** *21/02*

**U.S. Cl. 91—20** **18 Claims**




1. A vibratory device comprising a hollow cylinder with terminal end plates, an inner sleeve fitted in said cylinder and extending between said end plates, said cylinder having an inlet for a gaseous pressure fluid, said sleeve having an inlet opening in registry with said inlet in the cylinder for flow of the pressure fluid therethrough, and a piston slidably mounted in said sleeve for undergoing reciprocating movement therein, said inner sleeve having a pair of axially spaced exhaust ports, said inner sleeve and cylinder defining two circumferential passages therebetween each in axial registry with a respective exhaust port, said cylinder having two outlet ports each in communication with a respective circumferential passage and therethrough with a respective exhaust port, each outlet port in the cylinder being circumferentially displaced with respect to the associated exhaust port in the inner sleeve, said piston being provided with two passageways, each for establishing communication between the inlet opening in the sleeve and a respective working chamber formed between one end of the piston and one terminal end plate, said piston in the course of

reciprocating movement passing through respective axial positions in which the piston successively covers and uncovers each exhaust port in the inner sleeve.

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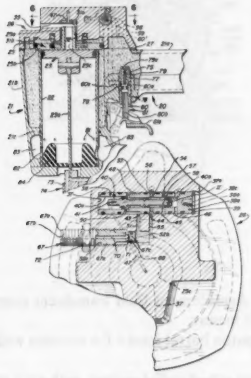
3,895,562

## PNEUMATICALLY POWERED FASTENER-DRIVING TOOL

**Samir El Guindy, Mt. Prospect, Ill., assignor to Spotnails, Inc., Rolling Meadows, Ill.**

**Filed Aug. 16, 1973, Ser. No. 388,730**
**Int. Cl. F01l** *25/06;* **F15b** *11/15*
**U.S. Cl. 91—308** **8 Claims**



**1.** A pneumatically powered fastener-driving tool comprising a housing having sections thereof charged with pressured air; a cylinder disposed within said housing; a reciprocating drive piston mounted within said cylinder for movement between extended and retracted positions; adjustable first valve means disposed at one end of said cylinder for movement between open and closed positions with respect thereto; manually actuated second valve means mounted on said housing for controlling the movement of said first valve means to said open position whereby said drive piston is exposed to pressured air and moves from said retracted to said extended positions; and a cap removably mounted on said housing adjacent said cylinder one end; said cap including a first cavity in which said first valve means is adjustably mounted, a second cavity spaced from said first cavity, a pneumatically responsive third valve means adjustably mounted within said second cavity, said second cavity being provided with a plurality of longitudinally spaced ports, a first passageway, when said first valve means is in an open position, connecting one of said housing sections charged with pressurized air with a first port, second and third ports being interconnected by a by-passing second passageway, said third port being continuously charged with pressured air, a third passageway connecting a fourth port with a second portion of said first cavity, the first and second portions of said first cavity being continuously separated from one another by said first valve means, a fourth passageway connecting a fifth port with said second valve means, said third valve means when in one position of adjustment effecting interconnection of said fourth and fifth ports through said second cavity whereby said drive piston moves from said retracted position to said extended position, and when in a second position of adjustment, effecting interconnection of said third and fourth ports whereby said drive piston moves from said extended position to said retracted position; and an exhaust passageway connected to said first cavity and communicating with said first passageway when said first valve means is in said closed position with respect to said cylinder one end; said cap including manually adjustable cycle-control means disposed within said second passageway and, when in a first position of adjustment, effecting interconnection of said second and third ports and repetitive cycling of said drive piston while said second valve means is manually retained in an actuated condition, and when in a second position of adjustment, interrupting interconnection between said second and third ports whereby said drive piston will make only one complete cycle and return to its original position upon said second valve means being manually actuated and then released.

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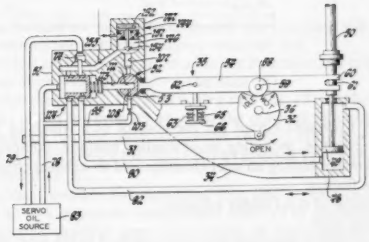
3,895,563

## HYDRAULIC SERVOMOTOR

**Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.**

**Division of Ser. No. 291,213, Sept. 22, 1972. This application Jan. 14, 1974, Ser. No. 433,010**
**Int. Cl. F15b** *9/10*
**U.S. Cl. 91—384** **4 Claims**




**1.** A power servo system comprising, in combination, a double-acting expansible chamber motor having a movable output member; a movable input member; a servo control valve; a feedback linkage interconnecting the input member, the output member, and the servo control valve; a source of servo fluid under pressure; a fluid return line; two motor lines for conducting servo fluid to and from the motor; a slave valve connecting the motor lines reversibly to the fluid source, the slave valve being biased in one direction by source pressure

and in the other direction by a control pressure; the servo control valve including, in series as recited, a connection to the source, a first variable restriction means, a connection to supply control pressure to the slave valve, a second variable restriction means, and a connection to the return line, the said first and second variable restriction means being varied reversely by movement of the feedback linkage; and fixed throttling means disposed between the source and the servo control valve.

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**3,895,564**

## CIRCUIT FOR THE CONTROL OF A WINCH BY FLUID UNDER PRESSURE INCLUDING AN UNWINDING POSITION

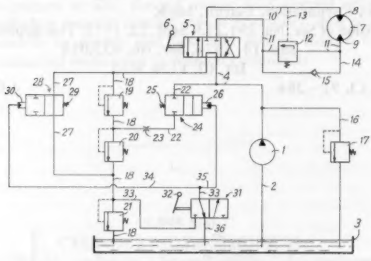
**Claude M. Pinson, Senlis, France, assignor to Societe Anonyme: Poclain, Le Plessis Belleville, France**

**Filed May 13, 1974, Ser. No. 469,687**

**Claims priority, application France, May 25, 1973, 73.19210**

**Int. Cl.² F15B** *11/08, 13/04*

**U.S. Cl. 91—418** **4 Claims**



**1.** A hydraulic circuit for the control of a winch by fluid under pressure, including an unwinding position, comprising:

a fluid motor having an inlet chamber and an exhaust chamber for the fluid,

a source of fluid under pressure,

a fluid tank,

a feed-pipe connecting the source of fluid to the inlet chamber,

a delivery pipe having an upstream end connected to the exhaust chamber and a downstream end communicating with the fluid tank,

a first calibrated discharge valve which is arranged in the delivery pipe,

a connecting tie-pipe which is connected on one end to the delivery pipe downstream of the first calibrated discharge valve with respect to the motor and is connected on an opposite end to the feed pipe,

a flow constriction member for adjustment of the flow of fluid in the tie-pipe,

and a second calibrated discharge valve arranged in the delivery pipe downstream of the connection of the tie-pipe to the delivery pipe.

**3,895,565**

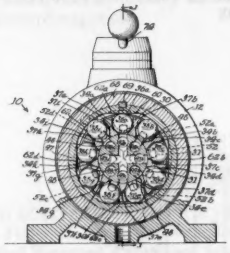
## VARIABLE DISPLACEMENT FLUID TRANSDUCER

**Henry Schottler, 8008 Country Club Ln., North Riverside, Ill. 60546**

**Filed Feb. 12, 1973, Ser. No. 331,549**

**Int. Cl. F01b** *13/06*

**U.S. Cl. 91—492** **5 Claims**



**1.** A variable displacement fluid transducer comprising:

rotatable shaft means;

a cylindrical piston barrel joined for rotation with said shaft means;

first and second sets of radial pistons, with each set comprising nine uniformly sized piston balls positioned for reciprocation within cylinder bores spaced uniformly around said barrel, said sets of pistons arranged on said barrel to define nine pairs of piston balls;

a piston chamber defined in said barrel for each pair of piston balls so that radial reciprocation of said pair of balls displaces fluid from the associated piston chamber; first and second cam tracks circumscribing said first and second sets of pistons, respectively; each of said tracks including four uniformly positioned cam lobes projecting inwardly toward said barrel in frictional engagement with the balls of one set of pistons and shaped to reciprocate the engaged piston balls with a cycloidal motion so that the relative rotation of said barrel with respect to said tracks orbits said balls into engagement with the cam lobes and reciprocates said balls radially to operate said transducer with a fluid displacement from said piston chambers having a substantially uniform flow through said transducer proportionate to the relative reciprocating movement of the balls comprising each pair;

control means to move said cam tracks to shift the circumferential alignment of said lobes on said first track with respect to the lobes on said second track to vary the fluid displacement of the transducer by changing the relative reciprocating movement of the balls comprising each pair; and

fluid porting means for directing fluid sequentially to and from each of said piston chambers during the operation of said transducer.

3,895,566

## APPARATUS FOR ASSEMBLING PILES OF PRINTED SIGNATURES INTO BATCHES

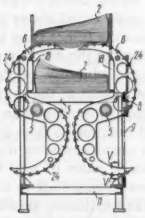
Nikolai Ivanovich Anikanov, Bolshaya Bronnaya ulitsa, 2/6, kv. 6, Moscow; Evgeny Arkadievich Baburin, prospekt Romena Rollana, 25, kv. 264, Kiev; Leonid Pavlovich Grachev, ulitsa Serafimovicha, 2, kv. 181, Moscow; Grigory Iosifovich Zax, ulitsa Mechnikova, 14a, kv. 24, Kiev; Mikhail Evseevich Frumkin, Naberezhnaya Novikova-Priboya, 9, kv. 34; Grigory Avramovich Radutsky, 16 Parkovaya ulitsa, 49, korpus 2, kv. 68, both of Moscow, and Rafail Efimovich Kheifets, Brest-Litovsky prospekt, 162, kv. 30, Kiev, all of U.S.S.R.

Filed Nov. 12, 1973, Ser. No. 415,166

Claims priority, application U.S.S.R., Apr. 13, 1973, 1899753

Int. Cl. B65g *57/30;* B31b *1/98*

U.S. Cl. 93—93 R 4 Claims



1. An apparatus for assembling piles of printed signatures into batches, comprising: a rollerway for advancing the piles, and having a plurality of rollers mounted so that the ends thereof are free to thereby define a plurality of spaces respectively between each adjacent one of said rollers; two rotatably mounted shafts extending longitudinally of said rollerway one at each side thereof; a pair of S-shaped levers having arms and mounted in opposition to each other on said shafts and defining therebetween a zone for assembling the piles successively advanced by said rollerway, said shafts being arranged for timed rotation in opposite directions so that the arms of said levers pass through said plurality of spaces and move toward each other and overlap, whereby a pile advanced into said assembling zone is lifted by the arms of said shafts and is held in said zone and continuing rotation of said shafts causes said arms to spread apart to lower said pile onto a succeeding pile advanced by said rollerway so as to form a batch; two driven arbors respectively arranged longitudinally of said rollerway at both sides thereof in advance of said assembling zone; a rotatable drum mounted on each of said two driven arbors for guiding a pile of printed signatures into said assembling zone; a plurality of driven rollers arranged in said assembling zone in front of said S-shaped levers, said driven rollers extending vertically and forming two parallel arrays for effecting positive levelling of the lateral sides of a pile of printed signatures, as the latter is being advanced in said assembling zone by said rollerway.

3,895,567

## AIR OUTLET ARRANGEMENT FOR AIR CONDITIONING AND VENTILATING APPARATUS

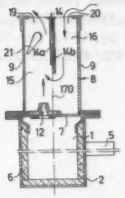
Werner Paul, Neckarstrasse 34, 73 Esslingen am Neckar, Germany

Filed Aug. 8, 1973, Ser. No. 386,573

Claims priority, application Germany, Aug. 30, 1972, 2242582

Int. Cl. F24f *3/02*

U.S. Cl. 98—38 7 Claims



1. Air outlet structure arrangement for air conditioning and ventilating apparatus comprising

an elongated box-like structure (2);

an internal elongated partition wall (7) subdividing said structure (2) into two elongated adjacent chambers (1,8), so that said wall (7) will be common to both said chambers and form one side of each;

the first of said chambers (1) forming an elongated pressure chamber (1);

the second of said chambers (8) having substantially parallel boundary walls (9, 10, 11);

means (5) supplying primary air to the pressure chamber (1);

a secondary air inlet (20) formed in the structure and communicating with said second chamber (8);

a mixed air outlet (19) formed in the structure and communicating with said second chamber (8);

orifice means (12, 13) penetrating said wall (7) and forming an outlet for primary air from the pressure chamber (1) leading into the second chamber (8) and being shaped to draw air through the inlet (20) by injector effect into said chamber (8);

partition means (14) extending into said second chamber (8) in a direction towards said wall (7) to partition said second chamber into a secondary air feed channel (16) communicating with said air inlet (20) and a second mixing chamber (15) communicating with said mixing air outlet (19), said orifice means (12, 13) and said air feed channel (16), the partition means (14) terminating short of said wall (7) to form a gap or slot (170) between the edge of the partition means and the wall (7); the spacing between said wall (7) and the lower edge of the partition means (14) being adjustable to adjust the width of said gap or slot;

the orifice means being located in said wall (7) to direct primary air into said mixing chamber of said second chamber and draw air from said air feed channel (16) through the gap, or slot (170) between the partition means (14) and said wall (7) and into said mixing chamber;

the inlet opening (**20**) communicating with the secondary air feed channel (**16**) being located adjacent to the air outlet opening (**19**) and in the plane containing the air outlet opening, so that the inlet opening (**20**) and the outlet opening (**19**) will be located adjacent each other, and separated by said partition means (**14**).

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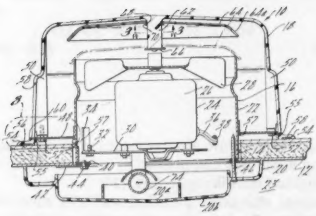
**3,895,568**

## VENTILATOR

**Thomas W. Stone, Owosso, Mich., assignor to Ventrola Manufacturing Company, Owosso, Mich.**

**Filed July 26, 1973, Ser. No. 381,901**
**Int. Cl.[2] F24F** *7/02, 13/10*
**U.S. Cl. 98—43** **3 Claims**



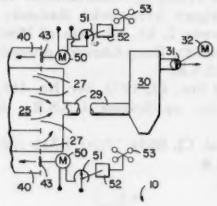
1. A ventilator adapted to be mounted on the ceiling of a room space to be ventilated and to ventilate the room space to the outside via an opening extending through the ceiling from the inside of the ceiling to the outside of the ceiling, said ventilator comprising a body, said body comprising a conduit having a generally vertical axis and defining a generally vertical passage, said conduit being open at the upper end thereof and adapted to communicate the room space to the outside via the ceiling opening, blower means for drawing air from the room space and blowing the same through said conduit to the outside, mounting means for mounting the ventilator on the ceiling, a damper located above said blower means and disposed over the open upper ends of said conduit, and guide means for guiding said damper for generally vertical bodily movement relative to said conduit, said damper being biased into a closed position closing the open upper end of said conduit when said blower means is idle and being displaced bodily upwardly from its closed position when said blower means is actuated, said guide means comprising a post generally coaxial with said conduit, said damper comprising means defining an opening therein, said post passing through said damper opening, said damper opening and the cross section of said post being of similar noncircular shape thereby to provide said damper with vertical sliding engagement with said post and substantially constraining said damper against rotary displacement about said post, and a cover covering the upper end of said body, said post being disposed on said cover, and retaining means for retaining said damper on said post, and an annular flashing plate generally around said conduit and extending in an outward direction therefrom generally parallel to the roof line.

**3,895,569**

## AIR MODULATING FUME SYSTEM

**Edward M. Miller, San Rafael, Calif., assignor to Industrial Clean Air, Inc., Berkeley, Calif.**

**Filed Sept. 26, 1973, Ser. No. 400,889**
**Int. Cl. F24f** *9/00*
**U.S. Cl. 98—115 R** **3 Claims**




1. A fume-control system comprising:
a. a building having a roof and roof trusses directly below and supporting said roof,
b. a source of hot fumes in said building,
c. a downwardly facing canopy-type hood situated in the roof truss area and spaced above said source of fumes,
d. means for exhausting fumes from said hood and for conducting said fumes to the exterior of said building,
e. means forming a plurality of downwardly facing air plenum chambers open at the bottom thereof to permit cold air at a temperature less than the ambient temperature within said building to flow downwardly therefrom, said air plenum chambers being disposed along and contiguous to opposite sides of said hood, said means (e) utilizing portions of said roof to form upper surfaces of said chambers and including panels secured to said roof trusses to form side walls of said chambers,
f. means for introducing cold air into said plenum chambers comprising blowers for each plenum chamber arranged to take atmospheric air directly from exteriorly of said building at a height above ground level and blow said air into said plenum chambers,
g. means forming openings in said building whereby winds exteriorly of said building may blow crosswise of said source of hot fumes,
h. means responsive to changes in velocity of said winds for increasing the speed of at least one of said blowers.

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**3,895,570**

## AIR-INSULATED WORK STATION

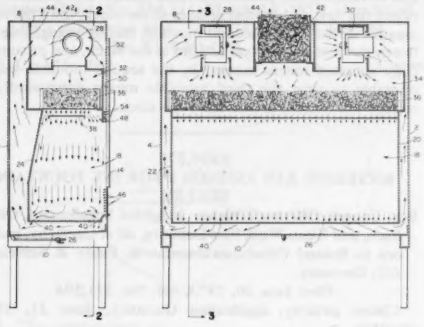
**John M. Eagleson, Jr., Kennebunk, Maine, assignor to The Baker Company, Inc., Stanford, Maine**

**Filed Sept. 27, 1973, Ser. No. 401,196**
**Int. Cl.[2] F23J** *11/00;* **F24F** *9/00*
**U.S. Cl. 98—115 LH** **8 Claims**

1. An air-insulated work station comprising the combination of:
bottom, side, and rear walls defining a work space, said bottom wall including a work surface for said work space, baffles cooperating with each of said walls to define air ducts exterior to said work space,
a front wall having an opening providing access to said work space,
blower means having an air intake from said ducts and adapted to blow air down into said work space toward said work surface, said ducts forming a return path to said blower means for air which has passed through said work space,
said work surface being perforated and at least one of said air ducts provided with air passageways to admit air respectively from said work space and from outside of said work station into said ducts,

exhaust means adapted to vent some of the air in said ducts from said work station, and thereby establish a flow of air from outside of said work station through said air passageways and into said air ducts to replenish the vented air, and

filter means in the path of air impelled by said blower means for removing contaminants therein, said filter means



intermediate said blower means and both said work space and said exhaust means,

the air flow produced within said ducts serving to insulate said work space from gaseous communication with the outside atmosphere resulting from leaks of unfiltered gas into said ducts, by passing substantially all the gas in said ducts through said filter means.

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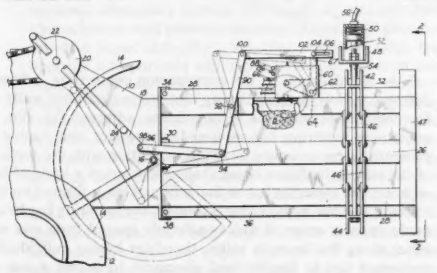
**3,895,571**

## BALER STRUCTURE WITH NEEDLE ACTUATED RELEASE MECHANISM FOR TENSION CONTROL

**Percy F. Freeman, 4061 S.W. Greenleaf Dr., Portland, Oreg. 97221**

**Filed June 27, 1974, Ser. No. 483,719**
**Int. Cl. B65b** *13/22*
**U.S. Cl. 100—4** **6 Claims**



**1.** A baler structure comprising

a. a support frame,

b. wall means on said frame defining a baling chamber for forming bales in end to end relation,

c. said wall means being movable between an outer tension relief position of bales in the bale chamber and an inner bale compressing position,

d. a twine feeding needle mechanism on said frame being movable between a lower inoperative position and an upper twine feeding position,

e. a knotter mechanism on said frame arranged to receive twine from said needle mechanism in the upper position of the latter,

f. pressure operated means engageable with said wall means for moving said wall means to said bale compressing position,

g. and relief means operated by said needle mechanism arranged in the upper feeding position of the latter to relieve said pressure operated means whereby said wall means can move outwardly at such time through their tension relief position so that twine around the bale can move between bales to make an excess amount available to the knotter for forming a knot.

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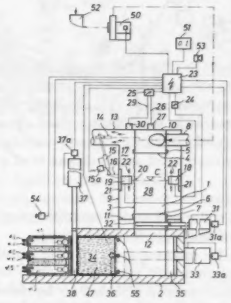
**3,895,572**

## APPARATUS AND METHOD FOR PRE-CONDENSING AND PRESSING FIBER MATERIAL INTO A BALE

**Heinz Nitschke, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland**

**Filed Nov. 21, 1973, Ser. No. 417,738**
**Claims priority, application Switzerland, Nov. 27, 1972, 17218/72**
**Int. Cl. B30b** *13/00*
**U.S. Cl. 100—35** **13 Claims**



**10.** A method for pre-condensing and pressing fiber material into a fiber bale comprising the steps of

forming a charge of fiber material in a vertical collecting chute,

pre-condensing the charge in the chute to a presetable degree under an air pressure differential, and

depositing the pre-condensed charge into a bale press below the chute while subjecting the charge to an increased pressure differential between the chute and press, said step of depositing being carried out in response to a predetermined height of the charge in the chute.

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**3,895,573**

## CYLINDRICAL BALE FORMING SYSTEM

**Carmen S. Phillips; Albert G. Blanton, and Fenton L. Kenna, Jr., all of Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.**

**Filed Sept. 16, 1974, Ser. No. 506,480**
**Int. Cl.**[2] **A01D** *39/00*; **B30B** *5/06*, *9/00*
**U.S. Cl. 100—88** **5 Claims**

**3.** In a baler adapted to form a cylindrical bale of fibrous material in a bale-forming zone, the combination comprising:

a frame;

an endless belt conveyor disposed on the frame and having an upper run movable in a front-to-rear conveying direction and defining the bottom of said bale-forming zone;

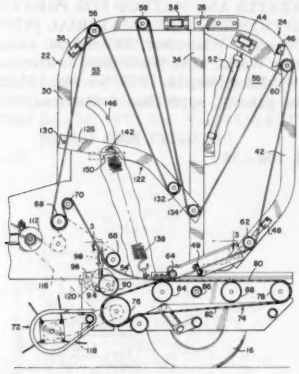
a superstructure on said frame extending above said belt conveyor, said superstructure including a gate pivotally mounted for rearward opening about a transverse pivot axis;

a roller journaled on an end of said gate and disposed in proximity to said upper run of said belt conveyor and defining therewith a rearmost parameter of said bale-forming zone;

a feed roller journaled on said superstructure above said upper run proximate to the front thereof to guide incoming material onto said belt conveyor;

a power drive roller journaled on said superstructure closely above said feed roller so as to define therewith a forward parameter of said bale-forming zone;

a plurality of bale-forming belts on said superstructure in forwardly running engagement between said gate-



mounted roller and said drive roller so as to define the top portion of said bale-forming zone;

and means for maintaining said bale-forming belts in non-driven relation with said power drive roller while maintaining said belts in position to be driven by said drive roller in response to receipt of material into said zone, whereby material will not be ejected by said belts from said zone.

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**3,895,574**

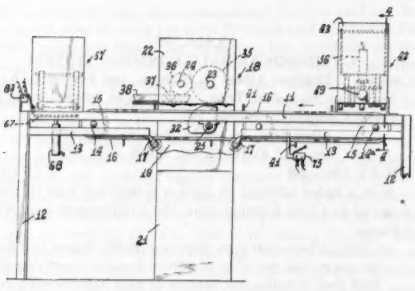
## APPARATUS FOR FEEDING, PRINTING AND STACKING ARTICLES

**Ralph A. Nyborg, Naperville, Ill., assignor to Maran Manufacturing Corporation, Pompano Beach, Fla.**

**Filed Aug. 17, 1973, Ser. No. 389,360**

**Int. Cl. B41f** *17/26;* **B65h** *3/32*

**U.S. Cl. 101—37** **8 Claims**



**1.** Apparatus for imprinting indicia on articles comprising, in combination, conveyor means, means to deliver articles one at a time onto said conveyor, printing apparatus associated with said conveyor, drive means for said conveyor to advance said articles toward and past said printing apparatus, and means to receive printed articles discharged from the conveyor, wherein the means to deliver articles onto the conveyor comprises first movable means normally engaging beneath the bottom article in a stack of articles to hold the stack elevated above the conveyor, second movable means normally disengaged from the stack, a pneumatic cylinder carried by the second movable means and a piston rod operable in said cylinder and connected to said first movable means for withdrawing the first movable means out from beneath the stack and advancing the second movable means into position between the first and second articles in the stack, third movable means carried by the second movable means engageable between the first and second articles in the stack, and pneumatically actuated means carried by the second movable means operable to urge the third movable means downwardly to release the bottom article from the stack.

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**3,895,575**

## METERING BAR ASSEMBLY FOR INK FOUNTAIN ROLLER

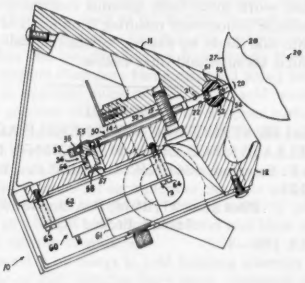
**Bert Cappel, Offenbach-Bieber; Siegfried Schuhmann, Offenbach, and Klaus Wolf, Neu-Isenburg, all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany**

**Filed June 20, 1973, Ser. No. 371,594**

**Claims priority, application Germany, June 21, 1972, 2230126**

**Int. Cl. B41f** *31/02*

**U.S. Cl. 101—363** **8 Claims**



**1.** In an ink fountain, the combination comprising, a frame defining a horizontal retaining slot having parallel walls, a fountain roller rotatable in the frame adjacent the slot, a composite metering bar mounted in the slot and having a presented edge arranged in abutting relation with the surface of the roller, the frame being shaped to support a body of ink adjacent the metering bar so that a film of ink is formed on the roller by the bar as the roller is rotated, the metering bar being made up of a series of slides uniformly spaced from one another along the fountain roller, the slides having individually presented tips in longitudinal alinement to define zones of adjustment of the ink film, means including tough resilient material intimately occupying the spaces between the slides and covering the presented tips of the slides for bridging the slides so as to present to the roller a continuous metering edge of resilient material and so as to present to the respective walls of the slot continuous sealing surfaces while nevertheless permitting individual endwise relative movement of each slide toward and away from the roller independently of the adjacent slides, and separate adjusting means connected to each of the slides at a point remote from the presented edge for adjusting the endwise position of the slide in both directions with respect to the roller thereby to adjust the thickness of the ink film, the slides being relatively wide at the tips but of narrow width behind the tips thereby to provide a substantial width of resilient material between the slides in the region behind the tips to more readily absorb shear stress as adjacent slides are moved with respect to one another, the slides being substan-

tially free of the resilient material rearwardly of the slot to facilitate independent movement of the adjusting means.

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3,895,576

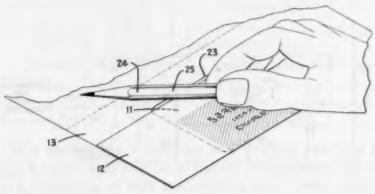
## MAIL ORDER SALES DEVICE

**Edward L. Fischer, Indianapolis, Ind., assignor to The Indiana National Bank, Indianapolis, Ind.**

**Division of Ser. No. 234,211, March 13, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,984**

**Int. Cl. B41l** *1/36, 47/04*

**U.S. Cl. 101—369** **3 Claims**




1. The combination of:

a credit card having a sheet body with upraised characters, said body including a length, width, height and thickness; a paper construction including a pocket with said pocket including:

a piece of plain paper backing having a size larger than said sheet body and including a first portion with instruction thereon and a second portion; and further including:

means mounted to said second portion of said backing operable to permanently display and store an image of said characters when rubbed by a member against said characters, said means including a top piece of pressure sensitive paper having an outer surface, an inner surface and a size also larger than said sheet body and having a dry coating of pressure rupturable capsules on said pressure sensitive paper which rupture when said outer surface of said pressure sensitive paper is rubbed forcing said inner surface of said pressure sensitive paper against said upraised characters leaving the image of said upraised characters on said pressure sensitive paper, said pressure sensitive paper including a top edge, a bottom edge and opposite side portions with a fixed distance between said top edge and said bottom edge, said pressure sensitive paper being mounted to said plain paper backing along said opposite side portions and said bottom edge of said pressure sensitive paper with said top edge of said pressure sensitive paper being free relative to said backing forming an opened top pocket in which said credit card is positioned and held when rubbed, said pocket being sized and adapted to receive said credit card with said upraised characters being adjacent and in contact with said pressure sensitive paper and on top of said plain paper backing, said height of said sheet body being greater than said fixed distance with said credit card projecting out of said pocket when positioned therein.

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3,895,577

## LONG BURNING DELAY BLASTING CAPS

**David T. Zebree, Kingston, N.Y., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Sept. 25, 1973, Ser. No. 400,591**

**Int. Cl. F42b** *3/16*

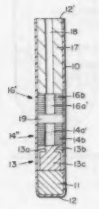
**U.S. Cl. 102—29** **7 Claims**

1. A long burning delay blasting cap assembly which comprises,

a closed shell, including a plug closure member therefor;

an explosive base charge, a primer charge and a delay charge disposed in said shell in that order toward said plug closure, said base charge detonatable in response to detonation of said primer charge and said primer charge detonatable in response to burning of said delay charge, and said delay charge having a burning time of at least 1.5 seconds;

an ignition assembly in said shell intermediate said plug closure and said delay charge, including a tube member and an ignition charge within said tube member as a core therein, and said core ignition charge having a heat of reaction of at least 50 calories per gram;




a booster ignition charge having a heat of reaction of at least 60, but less than about 110, calories per gram intermediate said core ignition and delay charges, said booster ignition charge being ignitable in response to burning of said core ignition charge, and said delay charge being ignitable by heat and pressure from burning of said core and booster ignition charges; and

means in said plug closure for support of initiator means for said core ignition charge.

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3,895,578

## FLARE WITH ADHESIVE LINER

**Graham C. Shaw, Garland, and Russell Reed, Jr., Brigham City, both of Utah, assignors to Thiokol Corporation, Bristol, Pa.**

**Continuation of Ser. No. 138,780, April 29, 1971, abandoned. This application Aug. 14, 1973, Ser. No. 388,317**

**Int. Cl.[2] C06D** *1/10*

**U.S. Cl. 102—37.8** **13 Claims**

1. In a flare having a tubular case and a colored illuminant composition in the case, the improvement comprising an adhesive liner on the inner surface of the case to provide a bond and thermal insulation between the case and the illuminant composition that will promote coextensive linear consumption of case, liner, and illuminant, comprising a cured mixture of:

a saturated, carboxyl-containing polyester, liquid polymeric binder; and

an oxidizer/coloring agent selected from the group consisting of strontium nitrate, potassium perchlorate, sodium nitrate, and barium nitrate, the oxidizer being in stoichiometric deficiency and selected for color compatability with the illuminant— the color of the oxidizer/coloring agent being produced by the predominant flame spectra thereof.

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3,895,579

## IRRITANT AGENT DEVICE

**Heinz Gawlick; Hans Kuschel, both of Furth; Gunther Marondel, Aussere; Werner Siegelin, Stein, Nurnberg, and Wolfgang Spranger, Furth, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany**

**Filed Mar. 23, 1973, Ser. No. 344,099**

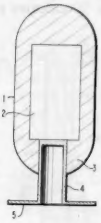
**Claims priority, application Germany, Mar. 25, 1972, 2214801**

**Int. Cl. F42b** *13/46*

**U.S. Cl. 102—65.2** **20 Claims**

1. An irritant agent device comprising an irritant agent element including a cartridge for housing an irritant agent and

a soft, resilient casing provided about said cartridge, and launching tube means connected with said irritant agent element and positioned in said resilient casing for facilitating the launching of said element, said launching tube means being detachably connected with said irritant agent element for



separation from said element after launching of said element, said launching tube means including aerodynamic braking means responsive to air flow after launching of said element for aiding in the separation of said launching tube means from said irritant agent element.

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**3,895,580**

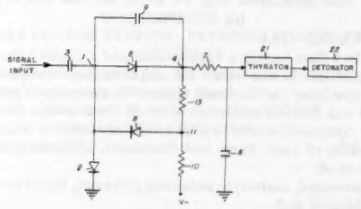
**BAND PASS INTEGRATOR FOR PROXIMITY FUSES**

**Paul M. Tedder, deceased, late of Gainesville, Fla., and by Yvonne M. Tedder, administrator, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 17, 1957, Ser. No. 690,880**

**Int. Cl. F42c** *13/04*

**U.S. Cl. 102—70.2 P** **2 Claims**




**1.** A band pass integrator circuit for a proximity fuze comprising in combination: low frequency cutoff means located at the input of said circuit, first diode means for clamping at ground potential the positive peaks of an input signal applied to the input of said circuit, second diode and resistor means for providing partial clamping of the negative peaks of an input signal applied to the input of said circuit, said partial clamping causing said circuit to be desensitized in the presence of high frequency and high amplitude input signals, a capacitor charged to an initial voltage, said proximity fuze functioning when said capacitor discharges to a predetermined voltage, third diode means for causing the positive peaks of an input signal within the pass band of said circuit to discharge said capacitor, said capacitor discharging to said predetermined voltage when the positive peaks of an input signal within said pass band have a predetermined minimum value for a predetermined minimum time, and capacitor means connected to said third diode means to make said third diode means inoperable at frequencies outside of said pass band.

**3,895,581**

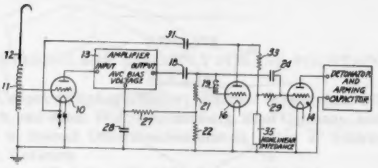
**VOLTAGE SUPPLY FOR RADIO PROXIMITY FUZE**

**Carlyle W. Jacob, Rochester, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 12, 1951, Ser. No. 215,043**

**Int. Cl. F42c** *13/04*

**U.S. Cl. 102—70.2 P** **7 Claims**




**1.** In a radio-controlled proximity fuze in which a high frequency signal is generated and radiated and received after reflection from a target approached by said fuze and a beat frequency signal derived from the two signals controls the detonation of said fuze, an electrically-actuated detonator adapted to initiate the detonation of said fuze, a gas-filled discharge tube adapted to actuate said detonator when ionized, means responsive to said high frequency and said reflected signals to bias said tube below its starting voltage, and means responsive to a selected amplitude and number of cycles of said beat frequency signal for ionizing said gas-filled tube.

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**3,895,582**

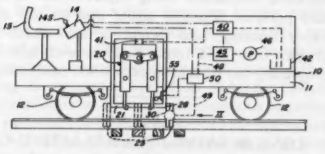
**BALLAST REACTION RAIL CLAMPS**

**Helmuth von Beckmann, Columbia, S.C., assignor to Canron Inc., Phillipsburg, N.J.**

**Filed Dec. 13, 1973, Ser. No. 424,279**

**Int. Cl. E01b** *27/17*

**U.S. Cl. 104—12** **6 Claims**

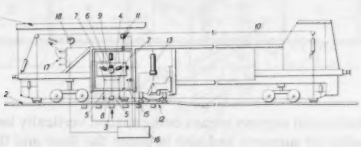


**1.** A tamping machine comprising a wheel mounted chassis; a tamping head, mounted on the chassis, for penetration of railroad track ballast, rail gripping means on the machine chassis; and actuating means, responsive to tamping head downward movement, for initiating the closing of said rail gripping means.

## 3,895,583
## METHOD AND APPARATUS FOR TAMPING AND LEVELING TRACK

**Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria**

**Filed Apr. 8, 1974, Ser. No. 458,580**
**Claims priority, application Austria, May 25, 1973, 4627/73**
**Int. Cl. E01b** *27/17*
**U.S. Cl. 104—12** **8 Claims**



**1.** In a mobile track tamping and leveling machine for obtaining a controlled degree of ballast compaction and leveling a track consisting of rails mounted on ties, which comprises a vertically adjustable tamping tool assembly including reciprocating and vibratory drive means for exerting pressure on the tamping tools to tamp the ballast under respective ones of the ties, a track lifting means, a track level reference system, a track level error pickup and transmitting device associated with the reference system to sense any error and to convert the sensed error into an electrical error signal proportional to the sensed error, and a control connected to the device and receiving the proportional error signals therefrom, the improvement of

1. the control comprising a control circuit including a pressure control valve connected to the track level error pickup and transmitting device and operative to control the pressure on the tamping tools continuously in proportion to a maximum error signal received from the device, combined with a
2. a track holding device holding the track at the leveled position determined by the refereence system against any upward pressure of the tamped ballast,
3. a pressure-controlled drive for the track holding device to adjust the vertical postion thereof, and
4. a valve for controlling the drive connected to the control circuit.

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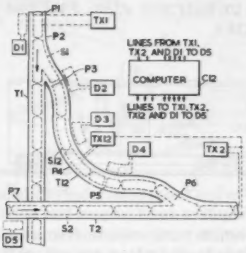
## 3,895,584
## TRANSPORTATION SYSTEMS

**Denys Ian Paddison, Godalming, England, assignor to British Secretary of State for Defence, London, England**

**Filed Feb. 6, 1973, Ser. No. 330,149**
**Claims priority, application United Kingdom, Feb. 10, 1972, 6382/72**
**Int. Cl.² B61L** *21/04*
**U.S. Cl. 104—88** **12 Claims**

**1.** A transportation system comprising a plurality of tracks and a plurality of remotely controllable vehicles constructed to run over the said tracks, wherein the said tracks comprise at least a first main track, a second main track, and a junction track by which vehicles may be driven from the first main track to the second main track, and the system also comprises first signalling means for sending control signals to vehicles on the first main track such that all vehicles on a continuous extended length thereof receive the same control signals to cause the said vehicles to proceed in a first regular traffic stream along the said first main track, means for sending signals to selected ones of the said vehicles to divert them on to the junction track, second signalling means for sending control signals to vehicles on the second main track such that all vehicles on a continuous extended length thereof receive the same control signals to cause the said vehicles to proceed in a second regular traffic stream along the said second main track, third signalling means for sending control signals to vehicles on the junction track to control their progress on the junction track and to make them responsive to signals derived from the second signalling means at selected times, further means for sending control signals derived from the second signalling means to vehicles on a part of the junction track to cause the said vehicles to match their speed to the speed of the




said second regular traffic stream, a plurality of vehicle detector means for detecting the passage of vehicles on the first main track, the second main track, and the junction track and receiving data signals from the said vehicles, and computer means connected to the vehicle detector means and to the first, second and third signalling means for controlling the transfer of selected vehicles from the first main track to the second main track.

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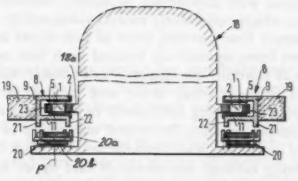
## 3,895,585
## TWO-SIDED LINEAR INDUCTION MOTOR ESPECIALLY FOR SUSPENDED VEHICLES

**Peter Schwärzler, Furstenfeldbruck, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany**

**Filed Dec. 17, 1973, Ser. No. 425,616**
**Claims priority, application Germany, Dec. 30, 1972, 2264320**
**Int. Cl.² B61B** *13/08*
**U.S. Cl. 104—148 LM** **7 Claims**



**1.** A double-sided linear induction motor, comprising a movable central stator having a core and coil means on said core, said stator having a pair of opposite active faces extending along the direction of displacement thereof; and a stationary reaction member extending in the direction of movement of said stator, said member being composed of ferromagnetic material and being of U-profile with opposite parallel shanks of the U flanking said stator and each spacedly juxtaposed with a respective one of said active faces; said shanks each being provided with a reaction layer of material of high conductivity along its surface confronting the respective active face, said core and said coil means being constructed and arranged to produce a traveling magnetic field along said member for displacing said stator in said direction with a substantial part of the flux return path between magnetic flux entry into and return from said shanks being around the bight of the U, said U-profile member constituting a rail of a magnetic-suspension vehicle track, at least one shank of the U

being formed with a pair of projecting flanges defining armature poles cooperating with an electromagnet.

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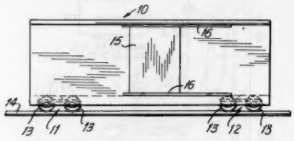
**3,895,586**

## RAILROAD CAR SUSPENSION SYSTEM

**Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706**

**Filed June 17, 1974, Ser. No. 479,751**
**Int. Cl. B61f** *5/30, 15/06;* **F16f** *1/44*
**U.S. Cl. 105—224.1** **1 Claim**



1. A railroad vehicle truck suspension structure for use with railroad freight cars having at least one axle, or the like, comprising, in combination: a journal box disposed at each transverse end of said axle; left and right longitudinally extending vehicle side frame members disposed at each transverse side of said freight car; first and second lower seat members disposed, respectively, fore and aft of the axis of said axle and each supported by a journal box; first and second spaced upper seat members, respectively, said upper seat members being integral with said left frame member during use; first and second elastomeric member disposed intermediate and captively held between each of said first upper and lower and said second upper and lower seat members, respectively, said elastomeric member providing progressively increasing resistance to vertical, transverse and longitudinal operating forces transmitted between the sprung mass and said axle; each of said lower seat members comprising a cup-shaped lower base portion thereof integral with upstanding, arcuately extending lower wall portions which collectively extend substantially half-way about said lower base portion, said lower base portion having bearing surfaces which engage one of said elastomers, said lower upstanding wall portions having curved surfaces which engage one of said elastomers; each of said upper seat members comprising a cup-shaped upper base portion thereof integral with depending, arcuately extending upper wall portions which collectively extend substantially half-way about said upper base portion, pairs of said upper and lower seat members being operatively located such that said upper and lower wall portions are disposed in opposite relationship with respect to each other about one of said elastomers, thereby captively limiting movement of the elastomer, said captive elastomer resisting horizontal movement of said upstanding and depending wall portions towards each other and further resisting vertical movement of said upper and lower base portions towards one another, thereby isolating rail-induced forces in each axle from the vehicle sprung mass.

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**3,895,587**

## RAILROAD CAR FOR TRANSPORTING AUTOMOBILES

**Richard M. Bell, Arundel, Del., assignor to Penn Central Transportation Company, Philadelphia, Pa.**

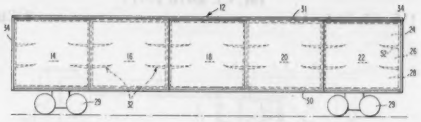
**Filed Sept. 13, 1974, Ser. No. 505,671**
**Int. Cl.² B65J** *1/22*
**U.S. Cl. 105—368 R** **12 Claims**

1. A railroad car for transporting vehicles, comprising:

a. a floor mounted on trucks;

b. a plurality of vertical support structures extending upwardly from said floor proximate to the longitudinal edges thereof and spaced longitudinally thereon such that the distance between adjacent supports is greater than the length of the vehicle to be transported therebetween; and

c. a plurality of horizontal support means for supporting a part of a vehicle, each support means being cantilevered from at least one of said plurality of vertical support structures and each extending longitudinally toward a vertical support structure and horizontal support means a distance sufficient to provide a surface area to support either the front or rear wheels of a vehicle thereon and to provide a clearance between adjacent cantilevered horizontal support means in the horizontal direction, said



horizontal support means being spaced vertically between adjacent supports and also between the floor and the first support a distance greater than the height of that portion of the vehicle to be transported therebetween, whereby vehicles may be loaded onto said railroad car in the longitudinal direction of both the car and the vehicle from a plurality of positions along the longitudinal side of the railroad car.

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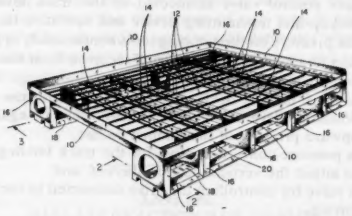
**3,895,588**

## HEAVY DUTY SHIPPING TRAY

**Ervin W. Miller, Huntington Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.**

**Filed Mar. 4, 1974, Ser. No. 447,820**
**Int. Cl.² B65D** *19/00*
**U.S. Cl. 108—51** **4 Claims**



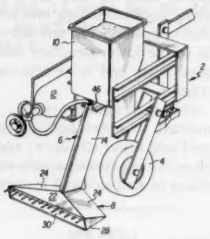
1. A load-bearing shipping tray comprising: a peripheral rim member having an L-shaped cross-section with an inwardly-extending lip portion and an upwardly-extending lip portion; a plurality of wire rods fixed to said inwardly-extending lip portion of said rim member and extending from one end of the tray to the other in spaced parallel relationship to form a deck for the tray; a plurality of elongated deck support members affixed to said inwardly-extending lip portion of said rim member and extending from one side of the tray to the other in spaced parallel relationship under said wire rods; a first plurality of transversely-extending rectangularly shaped upright members affixed to the underside of said inwardly-extending lip portion of said rim and positioned in spaced parallel relationship under said rim along a first side of the tray; a second plurality of transversely-extending rectangular shaped upright members affixed to the underside of said inwardly extending lip portion of said rim member and positioned in spaced parallel relationship under said rim member along the second side of the tray; a first strip member affixed to the bottom edges of the upright members of said first plurality and extending along said first side of the tray as a first base runner displaced down from the plane of said deck and parallel thereto; and a second strip member affixed to the bottom edges of the upright members of said second plurality and extending along the second side of the tray as a second base runner displaced down from the plane of said deck and parallel thereto.

3,895,589

## SEED PLANTING APPARATUS

Thomas H. Garner, Seneca, and Byron K. Webb, Clemson, both of S.C., assignors to Cotton Incorporated, New York, N.Y.

Filed Sept. 13, 1973, Ser. No. 396,674
Int. Cl. A21c *23/02*
U.S. Cl. 111—7 10 Claims



1. A seed planting implement comprising:

a supporting shank having means at the upper end of the shank for attachment to a vehicle;

a sweep secured to the lower end of the shank, said sweep being substantially hollow and having a top wall and bottom wall spaced apart from each other and having an opening at the rearward side of said sweep;

nozzle means mounted in said sweep, said nozzle means being spaced forwardly from said opening, and being between said top and bottom walls;

means providing a source of fluid under pressure and including conduit means extending through the interior of said shank for conducting fluid from said source to said nozzle means;

means providing a source of seeds spaced above the bottom wall of said sweep and including passage means in said shank for conducting seeds from said source to an aperture in the bottom wall of said sweep whereby fluids may be sprayed by said nozzle means through said sweep rearward opening and seeds may be deposited in a furrow under the sweep, as the sweep is drawn through the soil; said sweep including laterally extending forward edges, said top wall including a wedge portion intersecting said bottom wall along said lateral edges; and

said bottom wall being substantially flat, and said implement including a runner opener extending along the forward side of said shank and along said bottom wall in alignment with said bottom wall aperture.

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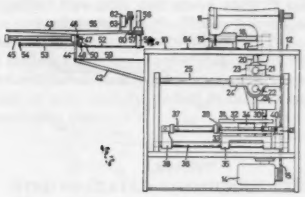
3,895,590

## AUTOMATIC APPARATUS FOR SEWING POCKETS ON GARMENTS

Silvano Perlino, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Apr. 12, 1973, Ser. No. 350,540
Claims priority, application Italy, Apr. 14, 1972, 42907/72
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 2 Claims

1. An apparatus for sewing pockets on garments comprising a supporting frame, a table top fixed to said frame, a sewing machine fixed to said table top; an electric motor fixed to said frame for actuating said sewing machine, two parallel guides fixed to said frame, a slide bushed to one of said guides and slidable along the other, two blocks rigidly fastened to said slide, two superimposed parallel guides positioned orthogonally to said parallel guides the upper of which is fastened to said blocks and the lower of which is fastened to said slide, a slide positioned on and slidable along said superimposed parallel guides, a pivotable pocketholder nipper carried by said last mentioned slide, a support plate positioned on said table and movable with said nipper, a motor reducer fastened to said last mentioned slide having a shaft of magnetizable material, two parallel cyiindrical bars mounted on said frame parallel to said parallel guides, a support block mounted for displacement on said bars, an electromagnetic template mounted on said support block and contactable by said magnetizable



shaft, a pneumatic cylinder fixed to one end of one of said bars and connected to said support block to displace said support block and thus the pocketholder nipper and said support plate from an operative position in which the pocket is sewn on the garment to a loading position in which a new garment is loaded.

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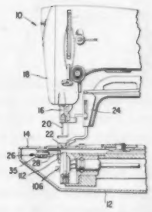
3,895,591

## THREAD CUTTING DEVICE

Karl H. Killinger, Dover, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,807
Int. Cl.[2] D05B *65/00*
U.S. Cl. 112—252 12 Claims



1. A thread cutting device for simultaneously severing a bobbin thread and one limb of a needle thread loop on a lockstitch sewing machine below a throat plate comprising, a thread puller member mounted on said throat plate for rotation about a fixed axis, said thread puller member comprising a cantilevered flange portion having an aperture, and a blade member mounted on said throat plate for rotatable movement with said puller member about said fixed axis, said blade member having a knife edge disposed in the aperture of said puller member.

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3,895,592

## BOAT LIFT

Arthur Shelly King, 8021 Cherokee Ln., Leawood, Kans. 66206

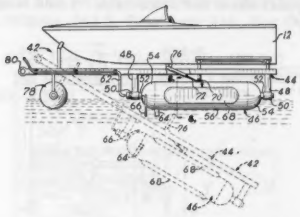
Continuation-in-part of Ser. No. 326,536, Jan. 24, 1973, abandoned. This application Jan. 9, 1974, Ser. No. 431,855
Int. Cl. B63c *1/6*
U.S. Cl. 114—45 11 Claims

1. A boat lift comprising:

a carriage;

a tubular, essentially closed, elongated pontoon having a continuous outer wall defining a chamber within the pontoon and provided with inlet means and outlet means; and

means rotatably mounting said pontoon on the carriage for rotation of the pontoon about its longitudinal axis between a float position wherein said outlet means is sub-



merged for trapping air within the chamber supplied through said inlet means and a sink position wherein said outlet means is open to the atmosphere for exhausting air from the chamber for entry of water into the latter.

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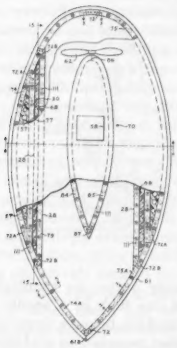
**3,895,593**

## LIGHT-WEIGHT, DURABLE, WATER-TRAVERSING VEHICLE

**Alvin Edward Moore, Manini Way, Diamondhead, Rt. 1, Bay St. Louis, Miss. 39520**

**Filed Sept. 24, 1973, Ser. No. 399,952**
**Int. Cl. B63b** *43/10*
**U.S. Cl. 114—56** **28 Claims**



1. A vehicle adapted to traverse water, including:

deck structure, having load-containing space above it;

sidewall framework, connected to said deck structure, comprising: a plurality of fore-and-aft sidewall beams of vehicle-strength-providing material, including pairs of spaced-apart, oppositely-positioned beams, each pair having spaced-apart, opposite surfaces of the two beams and opposite holes that extend into said material from said surfaces, each of said holes at one of the surfaces of the two beams opening toward and aligned with a similar, opposite hole in the other of said two beams;

hollow members of vehicle-strength-providing material, connecting and bracing said opposite beams, each of said hollow members having flanged ends extending into and braced in an aligned pair of said opposite holes; and securing means, holding said flanged ends in said holes and said hollow members in vehicle-strength-providing assembled relation;

lower water-traversing structure, fixed to said deck structure, comprising: a plurality of lower-structure beams of vehicle-strength-providing material, including pairs of opposite, spaced-apart beams having a plurality of opposite holes that extend into said material from opposite-beam surfaces of each pair of said lower-structure beams, each of said last-named opposite holes at one of said opposite-beam surfaces opening toward and aligned with a hole in the other of said opposite-beam surfaces; lower-structure hollow members of vehicle-strength-providing material, connecting and bracing said opposite lower-structure beams, each of said lower-structure hollow members having ends extending into an aligned pair of said last-named opposite holes; and securing means holding said ends of the lower-structure hollow members in said last-named holes and in vehicle-strength-providing assembled relation;

waterproof, vehicle-strength-providing, exterior skin means, connected to outer portions of said sidewall framework and said lower structure; and

vehicle-strength-providing, interior skin means, connected to inner portions of said sidewall framework.

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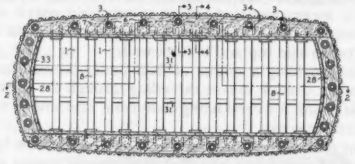
**3,895,594**

## PIPE-FRAMED, WATER-TRAVERSING VEHICLE

**Alvin Edward Moore, Manini Way, Diamondhead, Rt. 1, Bay St. Louis, Miss. 39576**

**Filed Oct. 15, 1973, Ser. No. 406,576**
**Int. Cl. B63b** *3/00*
**U.S. Cl. 114—81** **25 Claims**



1. A vehicle, adapted for travel over water, including:

buoyant, vehicle-strength-providing body framework, including a plurality of juxtaposed, quadrilateral, tubular framework members, encompassing a load-containing space, each of said members comprising: four elongated, end-joined pipes, having axes at angles to each other; a pair of elbow fittings joining ends of one of said pipes to the adjacent ends of two other pipes; two junction fittings connecting ends of a fourth pipe to the ends opposite to said adjacent ends of said other two pipes; one of said four pipes in each of said quadrilateral members being a substantially horizontal lower-deck pipe; bonding material between and connecting each of said fittings and the pipe ends associated with it; tie-members extending across said framework members and means connecting said tie-members to said pipes, each of said pipes having at least a part of its periphery contiguous to portions of said tie-members;

other substantially horizontal deck pipes, each of which lies between a pair of said first-named lower-deck pipes;

float-framework means below said body framework, including: a plurality of of float pipes, connected to said other deck pipes; junction fittings between said float pipes and said other deck pipes; and bonding material between and connecting each of said last-named junction fittings and one of said other deck pipes;

exterior, waterproofed skin means, adjacent to said pipes and tie-members, contiguous to said tie-members; and

interior skin means on said pipes and tie-members, contiguous to tie members;

each of said fittings including portions projecting beyond pipe peripheries a distance equal to the maximum thickness of the fitting around adjacent pipes; and each of said tie-members having portions projecting beyond pipe

peripheries an amount at least substantially equal to said distance.

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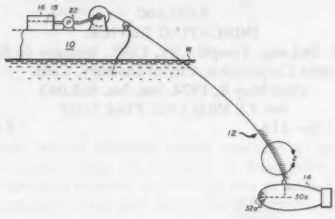
**3,895,595**

## PAIRED CABLE DRAG REDUCTION WITH NON-NEWTONIAN FLUIDS

**Raymond E. Kelly, and Richard E. Lovejoy, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 11, 1974, Ser. No. 441,724**
**Int. Cl.[2] B63B** *21/56, 1/34*
**U.S. Cl. 114—235 F** **11 Claims**



**1.** Towing cable apparatus for towing an underwater object from a towing ship in an aqueous medium, said apparatus comprising:

a towing shipboard reservoir for containing a supply of fluid having pronounced non-Newtonian characteristics;

a flexible towing cable comprising means for defining at least one elongate supply passage along a substantial portion of the cable length;

means, connected to said reservoir, for injecting non-Newtonian fluid from said reservoir into said supply passage under pressure; and

said cable being characterized by a plurality of outlet pores communicating between said supply passage and the exterior of said means for defining said passage, said pores being sized and spaced so that the effective areas thereof increase in proportion to distance from said means for injecting, whereby said fluid is distributed into a boundary layer of said aqueous medium adjacent the surface of said cable substantially uniformly along a predetermined portion of the length thereof.

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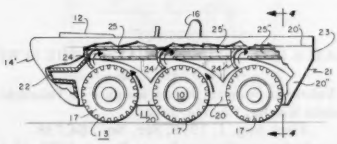
**3,895,596**

## AMPHIBIOUS VEHICLE

**William E. Amour, 515 S. 13th, Yakima, Wash. 98901**

**Filed Mar. 21, 1974, Ser. No. 453,460**
**Int. Cl. B60f** *3/00*
**U.S. Cl. 115—1 R** **4 Claims**



**1.** An amphibious vehicle, comprising:

a body-frame, having an inverted U-shaped duct at each respective side of said body-frame extending above the ground line, the forwardmost terminal ends of said ducts are enclosed by a prow-like nose of said body-frame, said prow-like nose portion having apertures through which fluid may be communicated to said wheels, and wherein the rearwardmost terminal ends of said ducts are enclosed by baffle plates issuing sidewardly from said body-frame,

an engine mounted in said body-frame; and

a drive train assembly including a row of wheels in each of said ducts, means for mechanically connecting said rows of wheels, said wheels being communicatingly interconnected with said engine, said ducts having deflectors mounted forwardly and above each of said wheels for receiving fluid drawn upwardly by rotation of said wheels, and conduits disposed rectilinearly in the interior top wall of each of said ducts communicating fluid from respective deflectors rearwardly from said ducts the rearwardmost ends of said conduits ending in orifices issuing through said baffle plates.

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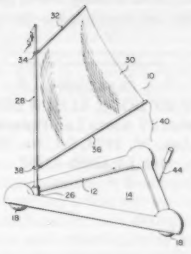
**3,895,597**

## WIND OPERATED AMPHIBIOUS VEHICLE

**Walter Olevsky, Carlstadt, N.J. 07072, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest**

**Filed May 8, 1974, Ser. No. 468,281**
**Int. Cl. B60f** *3/00*
**U.S. Cl. 115—1 R** **6 Claims**



**1.** A wind powered, amphibious vehicle comprising a three-cornered buoyant frame, a ball-shaped buoyant front wheel rotatably connected to the front corner of said frame; a ball-shaped buoyant rear wheel rotatably connected to each respective rear corner of said frame; dirigible means, mounted on said frame between said rear corners, including a pair of brake shoes contacting one of said rear wheels at a time to steer said vehicle when on land; a mast step adjacent said front corner of said frame; a rigged mast for propelling said vehicle is held in said step; a boom connected to said rigged mast; and a sheet connected to said boom.

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**3,895,598**

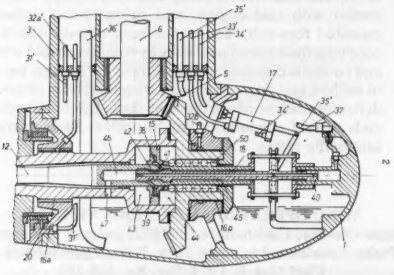
## SHIP PROPULSION UNIT HAVING A VARIABLE PITCH PROPELLER

**Karl Blickle, Bolheim, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany**

**Filed Feb. 19, 1974, Ser. No. 443,316**
**Claims priority, application Germany, Feb. 23, 1973, 2308931**
**Int. Cl. B63h** *1/14*
**U.S. Cl. 115—35** **3 Claims**

**1.** In a ship propulsion unit, the combination of a fixed housing, a vertical hollow member pivotable on said housing about a vertical axis, anti-friction bearing means in said fixed housing for supporting said hollow member therefrom in overhanging relationship to absorb axial and vertical forces, a hub mounted on said hollow member and pivotable therewith, a variable pitch propeller on said hub, means for driving said propeller comprising a drive shaft coaxially positioned within said hollow member, servo motor means within said hub for adjusting the pitch of said propeller blades, packing means between said hollow member and a portion of said housing, said packing comprising a plurality of pairs of spaced sealing

rings and an annular chamber being defined between each said pair of rings, a plurality of fluid pressure systems for said propeller and servo motor means and each system comprising a supply and a return line passing through an annular chamber



of said packing means, each of said supply and return lines having an outer portion connected to a said annular chamber from outside of said fixed housing and an inner portion within said hollow member and connected to the said annular chamber.

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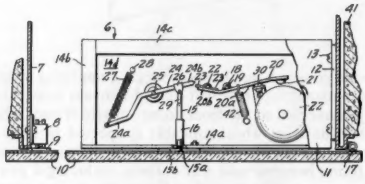
**3,895,599**
**CABINET DOOR ALARM DEVICE**
**Gerard J. Berkowitz, 17 Acorn Ln., Plainview, N.Y. 11803**
**Filed Aug. 30, 1974, Ser. No. 502,030**
**Int. Cl. G08b** *13/08*
**U.S. Cl. 116—95** **8 Claims**



1. A door-opening alarm device comprising in combination: a first lever means for providing contact and pivoted at a point spaced-away from one of upper ends of the lever arm means, a first end of the first lever arm means having a first contact surface;
and alarm means for initiating a signal and having a signal-initiating second contact surface positioned to be contacted by said first contact surface;
first biasing spring means for biasing said first lever arm in a direction such that said first contact surface is biased toward said second contact surface;
second lever-arm means for intermittent forcing of said first contact surface away from said second contact surface by acting upon said first lever arm means intermittently, in one of opposite to and fro alternate direction and having a third contact surface positioned for contact with a face of a closed door such that when in contact with the face of the closed door the first lever arm means is retained in a first direction such that the first contact surface is not forced away from the second contact surface, the second lever arm means being pivotably mounted at a point spaced away from at least one of opposite ends thereof, said one spaced away end of the second lever arm means being positioned for pressing against said first lever arm means in the direction such that force is impartable thereto for moving the first contact surface away from the second contact surface;
second spring means for biasing said second lever arm means toward a second direction such that when a face of a closed door is moved from a retaining contact with said third contact surface said first contact surface is caused to move away from said second contact surface, biasing action of said second spring means being greater than biasing action of said first spring means;
and spring biased-key means for providing force-imparting engagements of said second lever arm means with said first lever arm means when a face of a closed door is removed from retaining contact with said third contact surface and being mounted on one of the first and second lever arm means for engagement with the remaining other of the first and second lever arm means.

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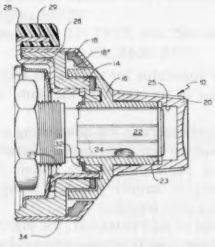
**3,895,600**
**INDICATING DEVICE**
**Robert J. DeLong, Temple City, Calif., assignor to Spectrol Electronics Corporation, City of Industry, Calif.**
**Filed May 8, 1974, Ser. No. 468,043**
**Int. Cl. H03j** *1/02;* **F16d** *51/22*
**U.S. Cl. 116—115** **8 Claims**



1. A device for indicating the angular position of a rotatable shaft comprising:
a base member;
a first rotatable indicator dial mounted on said base member and operably connected to said rotatable shaft for rotation therewith;
a second rotatable indicator dial;
gear means interconnecting said first and second indicator dials, said gear means functioning to rotate said second indicator dial incrementally once during every revolution of said first indicator dial; and
brake means having first second and third braking positions, said rotatable shaft being freely rotatable when said brake means is in its first braking position, said brake means when in its second braking position preventing rotation of said rotatable shaft except upon application of a force of a relatively large magnitude to said shaft, and said brake means when in its third brake position preventing any rotation of said rotatable shaft.

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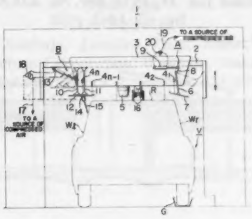
**3,895,601**
**APPARATUS FOR APPLYING WAX TO THE SURFACES OF VEHICLES**
**Shiegeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Nagoya, Japan**
**Filed Aug. 1, 1973, Ser. No. 384,735**
**Claims priority, application Japan, Dec. 1, 1972, 47-137570**
**Int. Cl. B05c** *5/00*
**U.S. Cl. 118—8** **1 Claim**

1. Apparatus for applying wax to the upper surfaces of vehicles during movement thereof, comprising: a portal structure through which a vehicle can pass; a guide rail in a position offset from the medial plane of said portal structure to guide the vehicle therethrough; a frame vertically movably mounted on said portal structure; a plurality of wax guns arranged on

said frame in laterally spaced relation to each other; a first wax receiving pan swingably supported by said frame on its side adjacent to said guide rail; first actuator means connected to said first wax-receiving pans so as to swing said first wax-receiving pan between an inoperative position and an operative position to intercept wax as ejected through the most adjacent one of said wax guns; a second wax-receiving pan swingably supported by said frame on its side remote from said



guide rail, second actuator means operable to swing said second wax-receiving pan between an inoperative position and an operative position to intercept wax as ejected through at least one of said wax guns most adjacent thereto; and sensor means arranged on said second wax-receiving pan for sensing the adjacent side surface of the vehicle and operably associated with said second actuator means to adjust the operative position of said second wax-receiving pan to the size of the vehicle.

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**3,895,602**

## APPARATUS FOR EFFECTING DEPOSITION BY ION BOMBARDMENT

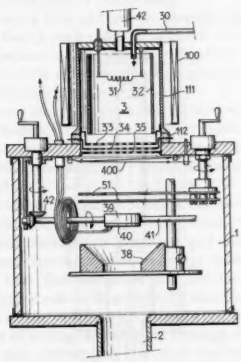
**Albert Bobenrieth, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Feb. 14, 1974, Ser. No. 442,623**

**Claims priority, application France, Feb. 20, 1973, 73.05937**

**Int. Cl. C23c** *13/12*

**U.S. Cl. 118—49.1** **6 Claims**



**1.** An apparatus for effecting deposition by ion bombardment, comprising an evacuated enclosure and in said enclosure: an ion source comprising at least one ion gun producing a uniform beam, a target mounted below said source and made of the material which is to be atomised, an object-holder aligned with and disposed between said source and said target so that ions passing said object-holder impinge on said target and supporting a substrate having a surface to be bombarded means for moving said holder between a first position exposing said surface to be bombarded to said beam and a second position exposing said substrate to the stream of atoms emanating from the target and means for blocking a portion of said beam whereby said beam does not impinge on said object-holder when said object-holder is in said second position.

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**3,895,603**

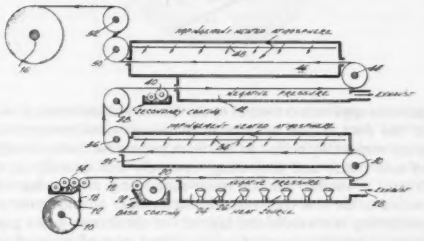
## APPARATUS FOR MANUFACTURING CORRECTION MATERIAL

**Victor Barouh, 935 Plum Tree Rd. West, Westbury, and Robert Glenn, 70-20 108th St., Forest Hills, both of N.Y.**

**Division of Ser. No. 222,538, Feb. 1, 1972, Pat. No. 3,776,756. This application Nov. 23, 1973, Ser. No. 418,424**

**Int. Cl. B05c** *9/06*

**U.S. Cl. 118—50** **1 Claim**



**1.** An apparatus for manufacturing correction material comprising means for continuously feeding strip material, first coating means for applying a base coating on said strip material, a first subatmospheric pressure drying chamber provided with heating means said chamber being adjacent said first coating means for feeding the strip material through said first drying chamber, a first treatment chamber adjacent said first drying chamber for impinging heated air at atmospheric pressure onto the strip material received from said first drying chamber to harden said base coating, a second coating means adjacent said first treatment chamber for applying a release coating over said strip material, a second subatmospheric pressure drying chamber devoid of heating means and adjacent said second coating means for vacuum drying said release coating aftersaid release coating has penetrated said base coating to said strip material, and a second treatment chamber adjacent said second drying chamber for impinging heated air at atmospheric pressure onto said strip material received from said second drying chamber, said apparatus having means for transporting said strip material sequentially through said first coating means, drying chamber and treatment chamber and said second coating means, drying chamber and treatment chamber.

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**3,895,604**

## DUCT COATING APPARATUS

**John W. Ryan, 1550 N. Lake Shore Dr., Chicago, Ill. 60610**

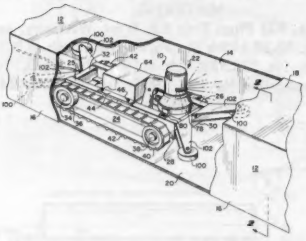
**Filed June 15, 1973, Ser. No. 370,347**

**Int. Cl. B05c** *7/02*

**U.S. Cl. 118—306** **1 Claim**

**1.** In a self-propelled vehicular apparatus for applying a liquid coating material to the inner wall surfaces of a rectangular duct having horizontal top and bottom walls and vertical side walls, in combination, a chassis in the form of a rectangular frame having front and rear transverse frame members and a pair of side frame members, front and rear axles projecting across said side frame members, driving drums on the outer ends of the rear axle, driven drums on the outer end of the front axle, crawler treads connecting each driving drum to an associated driven drum, a reversible electric drive motor mounted on said chassis in the medial region thereof, a gear

reduction drive mounted on said chassis rearwardly of the motor, means operatively connecting the gear reduction device to the motor, means operatively connecting the gear reduction device to one of said driven drums in driving relationship, a spraying device mounted on said chassis adjacent to the forward end of the latter and having a forwardly facing discharge slot designed for wide angle distribution of sprayed liquid coating material both laterally and vertically for simultaneous application thereof to the horizontal and vertical walls of the duct, a pair of outwardly diverging roller-supporting arms removably bolted to the front transverse frame member of said frame and projecting forwardly and laterally of the frame, a similar pair of roller-supporting arms removably bolted to the rear transverse frame member of said frame and projecting rearwardly and laterally of the frame, and a guide roller rotatably mounted on the distal end of each of said arms.



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**3,895,605**

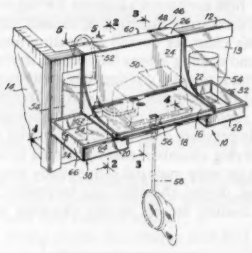
**AQUARIUM EQUIPMENT ORGANIZER**

**Marvin A. Goldman, Great Neck, N.Y., assignor to Penn-Plax Plastics, Inc., Garden City, N.Y.**

**Filed Apr. 1, 1974, Ser. No. 457,110**

**Int. Cl. A01k** *63/00*

**U.S. Cl. 119—5** **4 Claims**



**1.** An organizer apparatus for use with an aquarium tank or the like, which comprises

a. a central supporting tray including a horizontal bottom wall having a first predetermined article-supporting surface area and integral upstanding front and side walls;

b. an integral upstanding rear wall of greater height than said front and side walls;

c. an integral bracket means formed at upper portions of said rear wall for suspending said tray from and below the upper edge of an aquarium tank;

d. pairs of opposed, spaced parallel, integral L-shaped brackets formed on the lower surface of said bottom wall;

e. at least one auxiliary equipment tray with upstanding walls about its perimeter; and

f. outwardly entending integral horizontal flanges on said tray side walls for cooperating, sliding engagement with said opposed L-shaped brackets, providing at least one second article-supporting surface area slidingly, telescopically supported beneath said central tray for selective incremental expansion of the total exposed article-supporting surface area of said organizer apparatus.

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**3,895,606**

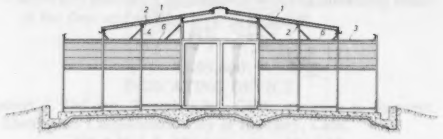
**MODULAR KENNEL BUILDING**

**Charles H. Galloway, P.O. Box 3449, Bryan, Tex. 77801**

**Filed Jan. 25, 1974, Ser. No. 436,538**

**Int. Cl. A01k** *1/00*

**U.S. Cl. 119—16** **6 Claims**



**1.** A modular animal enclosure, comprising:

a. a plurality of side panels and door panels, said side and door panels having bottom framing members and being arranged to enclose individual compartments;

b. a channel affixed to the bottom of side panels and door panels, said channel being adjustable at an angle to the bottom framing member of said side panels and door panels, for permitting angular displacement between said channel and said side panels and door panels to permit horizontal arrangement of said panels on a sloping surface; and

c. a gasket attached to the bottom of said channel of said side panels and said door panels for preventing communication of fluids between said compartments.

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**3,895,607**

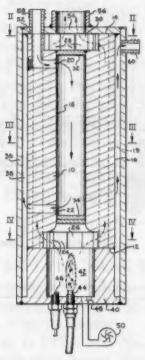
**FIRE TUBE FURNACE**

**Howard R. Johnson, Grass Lake, Mich., assignor to Hush Company, Inc., Wise, Va.**

**Filed Apr. 29, 1974, Ser. No. 465,322**

**Int. Cl. F22b** *7/00*

**U.S. Cl. 122—156** **17 Claims**



**1.** A fire tube furnace comprising, in combination, an elongated core of heat conductive material, a heat transfer surface defined on said core for engagement with a medium to be heated, a plurality of elongated passages defined in said core each having an inlet and an outlet axially spaced with respect to each other, a combustion chamber communicating with

said passages' inlet, burner means within said combustion chamber, flue means communicating with said passages' outlet, and combustion gas flow control means located at said passages' inlets tangentially introducing combustion gases into said passages whereby gases introduced into and passing through said passages have a spiralling path of movement.

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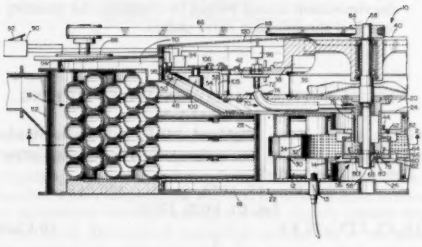
**3,895,608**

## COMBUSTOR

**Ravinder K. Sakhuja, Jamaica Plain, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.**

**Filed Dec. 14, 1973, Ser. No. 425,037**
**Int. Cl. F22b** *27/08*
**U.S. Cl. 122—250 R** **16 Claims**



1. In a vapor generator having a combustor adapted for use with a circumscribing tube bundle which conducts fluid to be vaporized into heat exchange relationship with combustion products, the combination comprising:

a. means forming first and second plenum chambers spaced from and facing each other to define a combustion chamber therebetween, said plenum chambers being adapted to receive a flow of precombustion gases for introduction to the combustion chamber;

b. a liquid fuel atomizer centrally located within the combustion chamber for directing fuel outward therefrom toward substantially the entire periphery of the combustion chamber, the periphery being adapted to receive the tube bundle;

c. means forming opposed openings centrally of the combustion chamber for establishing fluid communication between the combustion chamber and the first and second plenum chambers, said openings therefore being so arranged that fluid entering the combustion chamber therethrough tends to flow outward therefrom toward the periphery of the combustion chamber;

d. a plurality of passages extending through the combustion chamber and connecting the first and second plenum chambers to each other, said passages being arranged intermediate the central portion of the combustion chamber and the tube bundle and along a path surrounding the central portion of the combustion chamber; and

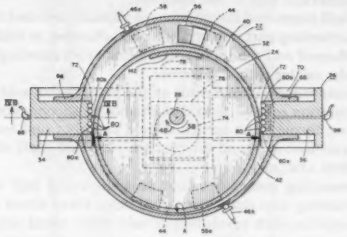
e. means forming openings in the surfaces of said passages facing the central portion of said combustion chamber for establishing communication between the combustion chamber and the connecting passages, said openings confronting the central portion of the combustion chamber.

**3,895,609**

## ROTARY INTERNAL COMBUSTION ENGINE

**John M. Armstrong, 3814 Greenburg Pk, Pittsburgh, Pa. 15221**

**Continuation-in-part of Ser. No. 280,654, Aug. 14, 1972, abandoned. This application Dec. 21, 1972, Ser. No. 317,205**
**Int. Cl. F02b** *53/08*
**U.S. Cl. 123—8.41** **18 Claims**



1. A rotary internal combustion engine comprising a casing, a rotor mounted for eccentric rotation within said casing, separator means engaging said rotor for dividing said casing in cooperation with said rotor into at least two chambers, said casing having a number of intake and exhaust ports, a valve member secured to said rotor for rotation therewith and having a valve opening therein positioned for successive juxtaposition to said casing ports, said casing having wall channel means in substantially diametrically opposed relationship, said separator means including a pair of separator members slidably mounted in said wall channel means, the outward ends of said separator members being connected rigidly through a yoke structure to maintain a predetermined spaced relation therebetween, an output shaft extending through said casing, said rotor being eccentrically mounted on said shaft, and means coupled to said shaft for reciprocating said yoke structure, said reciprocating means including an eccentric member affixed to said shaft and having a phasal relationship to said rotor such that the inward end portions of said separator members are maintained in engagement with adjacent surfaces respectively of said rotor without substantial bearing contact therewith but with sufficient contact to prevent passage of fluid material.

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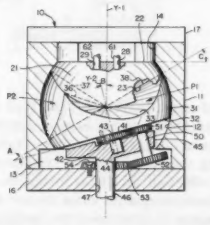
**3,895,610**

## ROTARY NUTATING ENGINE

**Robert H. Wahl, 1747 Creek Rd., Rochester, N.Y. 14625**

**Filed May 17, 1974, Ser. No. 470,860**
**Int. Cl. F02b** *53/00*
**U.S. Cl. 123—8.45** **9 Claims**



1. An engine, comprising

a housing having therein a spherical chamber,

a solid, segmental-spherical rotor movably mounted in said chamber adjacent one end thereof and having a solid operating surface confronting a stationary operating sur-

face formed in said chamber adjacent the opposite end thereof, said operating surfaces having centers which coincide with the center of said chamber,

each of said operating surfaces having therein a plurality of generally segmental-conical recesses emanating radially from the center of the surface and forming thereon a plurality of equi-angularly spaced ribs which project radially between said recesses from adjacent the last-named center to points immediately adjacent to the spherical wall of the chamber,

a shaft supported in said housing adjacent one end there and extending part way only into said chamber at said one end thereof and rotatable about a first axis extending through the center of said chamber,

means mounting said rotor on the inner end of said shaft for rotation relative to said shaft about a second axis extending through the center of said chamber and inclined to said first axis, and for rotation with said shaft about said first axis, and

connecting means between said shaft and said rotor for causing said shaft to revolve three times about said first axis for each revolution of said rotor about said second axis, thereby to impart rotary and nutating motion to said rotor to maintain said ribs on the operating surface of said rotor in sliding engagement with the stationary operating surface, whereby a plurality of revolving pockets are formed between said operating surfaces and the wall of said chamber and alternately expand and contract during rotation of said rotor and said shaft.

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**3,895,611**

**AIR-FUEL RATIO FEEDBACK TYPE FUEL INJECTION SYSTEM**

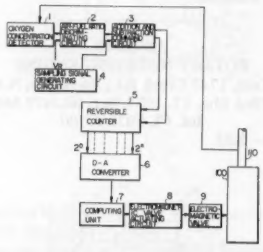
**Kunio Endo, Anjo; Junji Kawarada, Kariya; Motoharu Sueishi, Kariya; Susumu Harada, Oobu, and Hideaki Norimatsu, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Oct. 12, 1973, Ser. No. 406,109**

**Claims priority, application Japan, Oct. 17, 1972, 47-103727; Oct. 19, 1972, 47-104799; Oct. 28, 1972, 47-108220; Nov. 6, 1972, 47-110930; Nov. 7, 1972, 47-111750; Nov. 9, 1972, 47-112440**

**Int. Cl. F02b** *3/00*

**U.S. Cl. 123—32 EA** **9 Claims**




1. An air-fuel ratio feedback type fuel injection system having electromagnetic valve means connected to a constant pressure fuel line to inject the fuel into an internal combustion engine mounting the fuel injection system and a computing unit connected through an electromagnetic valve actuating circuit to the electromagnetic valve means for generating an injection pulse signal to determine the opening duration of the electromagnetic valve means thereby to control the quantity of said fuel to suitable various operating conditions of the internal combustion engine, comprising:

an oxygen concentration detector mounted in an exhaust pipe of said engine for detecting the concentration of oxygen contained in the exhaust gases of said engine,

an air-fuel ratio discriminating circuit means connected to said oxygen concentration detector for comparing an output signal of said detector with a predetermined value to generate an output signal,

a sampling signal generating circuit means for generating a sampling signal having a predetermined frequency,

an addition and subtraction command circuit means connected to said sampling signal generating circuit means and said air-fuel ratio discriminating circuit means for generating an output command signal in accordance with the output signal of said air-fuel ratio discriminating circuit each time said sampling signal is applied thereto, a reversible counter connected to said addition and subtraction command circuit means to perform the operation of addition or subtraction on the count thereof in accordance with said output command signal of said addition and subtraction command circuit means for generating a correction signal, and

valve opening duration correcting means connected to said reversible counter and further to said computer unit for controlling the opening duration of said electromagnetic valve means in accordance with said correction signal of said reversible counter in cooperation with said computing unit to reverse the output signal of said air-fuel ratio discrimination circuit means by changing the quantity of said fuel through said valve means.

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**3,895,612**

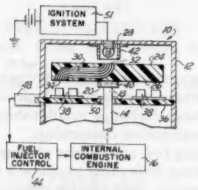
**LIGHT ACTIVATED SEQUENTIAL SWITCHING MECHANISM**

**William Arthur Keely, Highland, Mich., and Merle Manford Kreger, Jr., Liberty, Pa., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed June 17, 1974, Ser. No. 480,061**

**Int. Cl. F02b** *29/00*

**U.S. Cl. 123—32 EA** **10 Claims**




1. In a fuel injection system for an internal combustion engine, a light actuated sequential switching mechanism for sequentially activating the fuel injectors, said mechanism comprising:

a shaft coupled for rotation with the distributor timing shaft of an internal combustion engine;

a member having a pair of spaced broadside surfaces, one broadside surface attached to said shaft at the end opposite the coupling end, said member mounted for rotation with said shaft;

a source of light energy axially spaced from the end of said shaft and directed toward the other broadside surface of said member;

a fiber optic bundle mounted for support between said pair of broadside surfaces having one end adapted for receiving energy from said source of light opposite said other broadside surface and for conducting said received light energy to the one broadside surface; and

a plurality of light actuated switching members equal in number to the number of injectors and respectively electrically connected in circuit to the injectors, said members positioned in a circumferential spaced apart relationship about said shaft, said switching members spaced from said one broadside surface and each positioned to receive light energy from the other end of said bundle as

said shaft rotates for switching said members from one circuit condition to a second circuit condition.

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**3,895,613**

## AIR-COOLED INJECTION INTERNAL COMBUSTION ENGINE WITH TURBULENCE CHAMBER

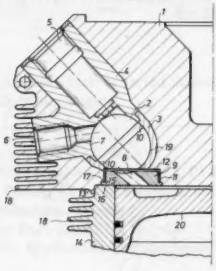
**Suryakant Joshi, Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany**

**Filed Oct. 11, 1973, Ser. No. 405,651**

**Claims priority, application Germany, Oct. 11, 1972, 2249766**

**Int. Cl. F02b** *3/00*

**U.S. Cl. 123—32 C** **1 Claim**



1. An air-cooled fuel injection internal combustion engine comprising a cylinder and a cylinder head with a turbulence chamber with a longitudinal axis and an inner mantle surface, the turbulence chamber having a length slightly greater than its maximum diameter of revolution and having a fuel injection passage tangential thereto for injecting fuel approximately parallel to the longitudinal axis of said turbulence chamber into the periphery thereof, which includes in combination therewith a heat insulated insert member having a passageway therethrough and forming a portion of that inner surface of said turbulence chamber which is located outside that range of surface which is to be impacted upon by the fuel during the fuel injection period, that inner mantle surface portion of said turbulence chamber which is formed by said insert member only being less than a quarter of the total inner mantle surface of said turbulence chamber, and said insert member having a medium height equaling from one quarter to one-third of said diameter of revolution and having a medium diameter equaling from two-thirds to one total of said maximum diameter of revolution.

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**3,895,614**

## SPLIT PISTON TWO-STROKE FOUR CYCLE INTERNAL COMBUSTION ENGINE

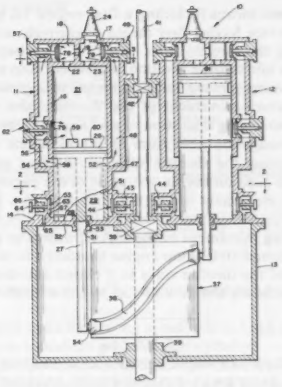
**Henry E. Bailey, c/o Bailey Lumber Company, P.O. Box 350, Walnut Creek, Calif. 94597**

**Filed Dec. 3, 1973, Ser. No. 421,334**

**Int. Cl. F02b** *33/44, 33/12*

**U.S. Cl. 123—67** **10 Claims**

1. In a two-stroke, four cycle internal combustion engine, the combination of means forming at least one cylinder having opposed first and second end walls, a piston mounted for reciprocating movement through power and compression strokes within the cylinder, one end of the piston separating the cylinder and cooperating with said first end wall to define a combustion chamber, the other end of the piston having a partition extending transversely across the cylinder and cooperating with said second end wall to define an air pumping chamber and an opposed combustible charge pumping chamber, first means to direct volumes of air and a combustible charge into respective air and charge pumping chambers during movement of the piston along its intake compression stroke, said volumes being compressed in respective chambers during movement of the piston along its power stroke, second means to direct the volume of compressed air from the air pumping chamber into the combustion chamber, third means to direct the volume of compressed charge from the charge



pumping chamber into the combustion chamber, fourth means to ignite the charge in the combustion chamber which is compressed by movement of the piston along its compression stroke, and exhaust means to exhaust the products of combustion from the combustion chamber.

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**3,895,615**

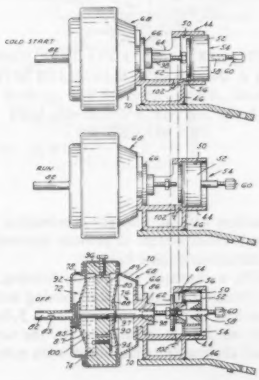
## CARBURETOR THROTTLE VALVE POSITIONER

**Phillip A. Schubeck, Woodhaven, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 7, 1973, Ser. No. 422,944**

**Int. Cl.² F02D** *11/08*

**U.S. Cl. 123—103 R** **11 Claims**




1. A carburetor throttle valve positioner comprising, in combination, an engine carburetor having an induction passage open to atmospheric pressure at one end and adapted to be connected to an engine intake manifold at the opposite end so as to be subject to engine vacuum varying in level from ambient atmospheric pressure at engine shutdown to a maxi-

mum subatmospheric pressure level during engine operating conditions, a throttle valve rotatably mounted across the passage and movable from a closed position to an engine idle speed position and beyond to a wide open throttle position, and return, for controlling flow through the passage, and control means to move the throttle valve to and between the positions,

the control means including a first engine vacuum responsive device having first means operatively acting on and biasing the throttle valve to a first open beyond normal engine idle throttle position, engine vacuum acting on the first means moving the first means to a position permitting return movement of the throttle valve to a closed position during operation of said engine; second movable stop means movable from an initial engine off position positioning the throttle valve in the first position to a second position during operation of the engine to prevent return movement of the throttle valve to a position less open than the normal idle speed position, and means effecting movement of the second means to a third position immediately upon engine shutdown to permit movement of the throttle valve to a closed anti-dieseling position reducing the flow of fuel to the engine.

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**3,895,616**

## IGNITION CONTACT BREAKER SYSTEM FOR INTERNAL COMBUSTION ENGINE

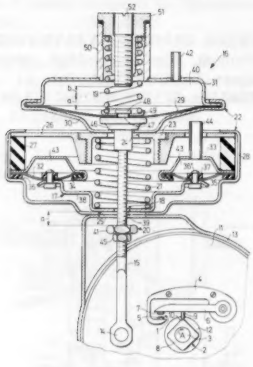
**Leo Steinke, Hegnach, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany**

**Filed Mar. 7, 1973, Ser. No. 338,903**

**Claims priority, application Germany, June 7, 1972, 2227629**

**Int. Cl.[2] F02P** *5/10*

**U.S. Cl. 123—117 A** **31 Claims**



1. In combination with an internal combustion engine, an ignition contact breaker system to provide ignition pulses for the internal combustion engine having

a housing (13), a camshaft (3) in the housing, a support plate (11) rotatably located in the housing and surrounding the camshaft, and breaker contacts (4, 5, 6, 7) located on the plate adapted to be engaged by the camshaft and opening and closing in synchronism with rotation of the camshaft,

means to rotate the support plate to adjust the relative angular position of the breaker contacts with respect to the lands of the cam of the camshaft comprising

a coupling link (15) secured to the plate (11) to rotatably move the plate;

first motion transmitting means (29, 40) coupled to the link (15) to move the link by a first distance (*a*) and hence rotate the plate (11) by a first angular excursion;

and means (32, 43) superimposing additional movement on said link in the same direction as said first distance (*a*) to move said link by an additional second distance (*b*) and hence rotate the plate by an additional second angular excursion.

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**3,895,617**

## INTAKE MANIFOLD DEVICE OF AN INTERNAL COMBUSTION ENGINE

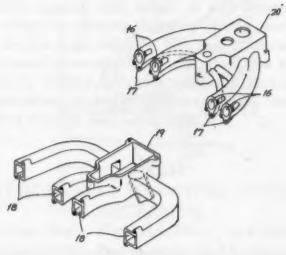
**Yoshitoshi Sakurai, Kawasaki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed June 22, 1973, Ser. No. 372,764**

**Claims priority, application Japan, June 28, 1972, 47-76220**

**Int. Cl. F02b** *19/10, 19/18*

**U.S. Cl. 123—122 AB** **2 Claims**



1. In a multi-cylinder internal combustion engine having main combustion chambers each connected to an auxiliary combustion chamber through a torch opening, respectively, the improvement comprising, in combination: an exhaust manifold connected to receive exhaust gases from each main combustion chamber, an intake manifold having main intake conduits for connection with each main combustion chamber, said intake manifold also having auxiliary intake conduits for connection to each auxihary combustion chamber, said intake manifold having a first chamber to receive a rich air-fuel mixture from a first carburetor, said intake manifold having a second chamber to receive a lean air-fuel mixture from a second carburetor, said auxiliary intake conduits communicating with said first chamber, said main intake conduits communicating with said second chamber, said exhaust manifold having an exhaust chamber in heat transfer relationship with said first and second chambers, said main intake conduits each being integrally associated adjacent said engine for heat exchange with one of said auxiliary intake conduits, respectively.

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**3,895,618**

## DIFFERENTIAL FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Peter H. Cerf, Edina, Minn., assignor to Anton Braun, Minneapolis, Minn.**

**Filed June 28, 1973, Ser. No. 374,380**

**Int. Cl.[2] F02M** *13/06*

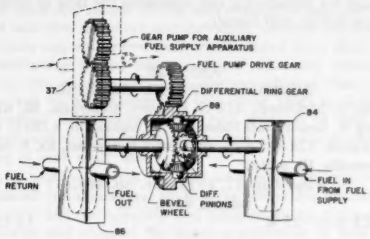
**U.S. Cl. 123—127** **2 Claims**

1. A differential fuel supply system for internal combustion engines comprising in combination:

a diesel engine having a combustion chamber, an injection nozzle, an air supply, a fuel supply and an auxiliary fuel supply apparatus connected to the air supply of the engine at a point remote from the injection nozzle;

means for determining the speed of and load on the engine including means for determining the rate of fuel flow to the engine; and

means controlled by the speed and load determining means for supplying a portion of the fuel to the auxiliary fuel




supply apparatus which is varied according to the speed of and load on the engine.

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**3,895,619**

## GOVERNORS FOR FUEL PUMPS

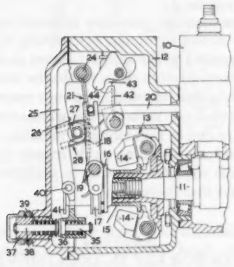
**James Charles Potter, London, England, assignor to C. A. V. Limited, Birmingham, England**

**Filed Dec. 28, 1973, Ser. No. 429,170**

**Claims priority, application United Kingdom, Dec. 29, 1972, 60140/72**

**Int. Cl. F02d** *1/12*

**U.S. Cl. 123—140 R** **6 Claims**



**1.** In combination with an internal combustion engine, a governor, a fuel injection pump of the type intended to supply fuel to an internal combustion engine, the pump having an adjustable control rod the setting of which determines the amount of fuel delivered by the pump, the governor comprising a housing, centrifugally operable means mounted within the housing and in use, driven at a speed representative of engine speed, a member movable by said means, a lever pivotally mounted in the housing and connected at one end to said control rod, said lever at its other end bearing on said member, whereby as the speed of the engine increases the lever will move in an direction to effect a reduction in the quantity of fuel supplied to the engine, a leaf spring acting on said member in a direction to oppose the action of said means, a ramp located within the housing, roller means acting intermediate the ramp and the leaf spring, means for adjusting the setting of said roller whereby the force exerted by the leaf spring on said member can be adjusted, said ramp being movably mounted within the housing and there being interposed between the ramp and the housing, resilient means which as the speed of operation of the engine continues to increase above a predetermined value, will be compressed thereby causing movement of the lever in a direction to reduce the amount of fuel supplied by the pump.

**3,895,620**

## ENGINE AND GAS GENERATOR

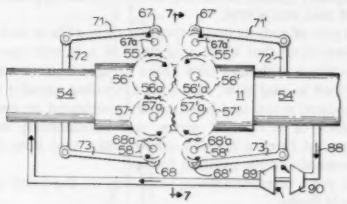
**Berry W. Foster, 2415 Thomas Ave., Redondo Beach, Calif. 90278**

**Division of Ser. No. 70,387, Sept. 8, 1970, Pat. No. 3,712,276.**

**This application Dec. 4, 1972, Ser. No. 312,042**

**Int. Cl. F02b** *77/00, 75/24*

**U.S. Cl. 123—197 R** **13 Claims**



**11.** An internal combustion engine comprising in combination:

a. an engine cylinder having a wall and a head end,

b. means to introduce gas into said cylinder,

c. an engine piston adapted to reciprocate in said cylinder and to compress said gas therein, said gas then limiting the stroke of said piston toward said head end,

d. a first rocker arm,

e. a first connecting rod extending generally in the same direction as said cylinder and connecting said piston and said first rocker arm to form an extended toggle to limit the stroke of said piston in a first direction,

f. a second rocker arm, and

g. a second connecting rod extending generally in the same direction as said cylinder and connecting said piston and said second rocker arm to form an extended toggle to limit the stroke of said piston in said first direction,

h. said first and second rocker arms being positioned to rock in the same plane and being synchronized to rock counter to each other, said plane also including the centerline of said cylinder, whereby toggle link forces on said first and second connecting rods normal to said cylinder wall are balanced on said toggle links to prevent high side forces from acting on said cylinder.

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**3,895,621**

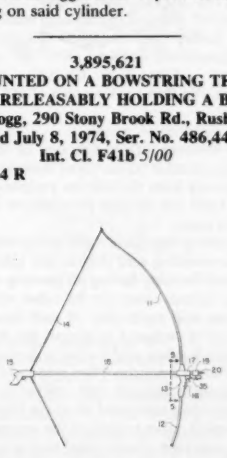
## MEANS MOUNTED ON A BOWSTRING TENSIONING DEVICE FOR RELEASABLY HOLDING A BOWSTRING

**Warren H. Kellogg, 290 Stony Brook Rd., Rush, N.Y. 14534**

**Filed July 8, 1974, Ser. No. 486,445**

**Int. Cl. F41b** *5/00*

**U.S. Cl. 124—24 R** **8 Claims**



**1.** In a longbow having bow limbs, a bowstring, a handle with a centerline arrow rest, and a cocking device, the improvement comprising:

a. a bracket supporting said cocking device and mounted on said handle and including means for pivoting said cocking device between an operating position generally transverse to said bow limbs and a storage position generally alongside one of said bow limbs;
b. latch means for latching said bracket to said handle in said operating position; and
c. said cocking device including:
1. a pair of guide sleeves on said bracket substantially equally spaced from said arrow rest on opposite sides of said arrow rest;
2. a pair of rods having respective sliding fits in said guide sleeves so that when said bracket is in said operating position with said bow limbs upright and an arrow is fitted to said bow, said rods extending parallel with a nocked arrow and horizontally positioned on opposite sides of a nocked arrow and substantially equally spaced from a nocked arrow when said bow is in a normal upright position for use;
3. a yoke interconnecting said rods on the back side of said limbs;
4. a trigger device interconnecting said rods on the belly side of the bow and rearwardly of the bowstring for holding and releasing said bowstring; and
5. releasable latch means for latching said yoke to said bracket to hold said rods and said trigger device in a full-draw position.

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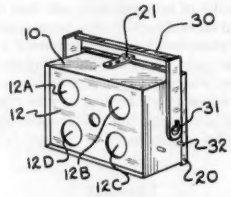
**3,895,622**
**REVERSIBLE COOKING UNIT**
**Wallace F. Krueger, 4401 Merriweather Ave., Toledo, Ohio 43623**
**Filed Mar. 18, 1974, Ser. No. 452,780**
**Int. Cl.[2] F24C** *3/14*
**U.S. Cl. 126—38** **2 Claims**




1. A reversible flip-flop cooking unit of the class described comprising,
a rigid flame distribution panel,
a gas burner element attached to one of the faces of said panel with a circular burner head designed to permit the gas to emit only from the sides or periphery of said circular burner head and in close proximity to said rigid flame distribution panel,
a housing securing said burner and said panel within it, said housing surrounding said burner and said panel on four sides and said housing having an opening on one end and a partially vented cover on its other end so that said burner faces said open side of said housing, and said vented cover is designed to permit the flue gases to escape through it when said burner is facing down and act as a secondary air source when said burner is facing up, and said panel is located with reference to said vented cover to provide a restricted air space between said panel and said vented cover to require the secondary air to flow across the rear side of said panel and around the sides of said panel to reach said burner when said burner is facing up, and the hot air and flue gases to escape around the sides of said panel and to flow across the rear side of said panel and through the vented openings in said partially vented cover when said burner is facing down,
means for rotating and locking in place said housing, which includes said burner and said panel, 180° so that in one position the burner is facing down and on rotation of 180° the burner is facing up,
means for introducing and regulating the flow of pressured gas fuel to said burner.

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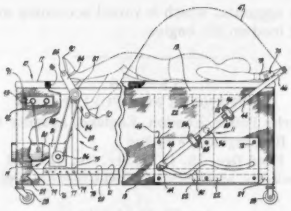
**3,895,623**
**PHYSICAL THERAPY MACHINE**
**Lavern N. Mahlandt, 410 S. Hickory, Centralia, Ill. 62801; John R. Smith, 900 Meadow Ln., Salem, Ill. 62881; Floyd R. Elliott, 124 S. Beech, and Larry D. Greene, Rt. 5, both of Centralia, Ill. 62801**
**Filed Apr. 17, 1974, Ser. No. 461,617**
**Int. Cl. A61h** *1/02*
**U.S. Cl. 128—25 R** **12 Claims**



1. In a physical therapy machine:
a. a support means,
b. an elongate member including an outer end,
c. drive and mounting means operatively connecting said elongate member to the support means including oscillating means operatively connected to the elongate member in sliding relation for oscillating movement of the outer end of said elongate member and translational movement of said outer end of said elongate member, said drive and mounting means including guide means operatively connected to the elongate member to predetermine the path of said outer end thereof.

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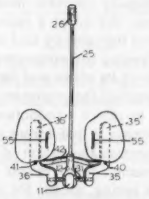
**3,895,624**
**APPARATUS FOR USE IN TREATMENT OF THE BILATERAL CLEFT LIP AND PALATE CONDITION IN INFANTS**
**Nicholas G. Georgiade, 2523 Wrightwood Ave., Durham, N.C. 27705**
**Filed July 18, 1974, Ser. No. 489,813**
**Int. Cl. A61f** *5/00*
**U.S. Cl. 128—76 R** **18 Claims**




1. A mouth cavity bone correction apparatus, comprising:
a. a pair of elongated laterally spaced arm members adapted to be intra-orally placed and having outer end portions residing in a common plane and adapted for intra-oral securement to selected similarly laterally displaced maxillary bone and having opposite end portions adapted to be positioned more intra-orally within the cavity and unsecured to said bone;

b. means for securing said arm member outer end portions to said bone;

c. an auxiliary structure adapted for intra-oral placement in operative association with said arm members providing an intra-oral mount for the said unsecured opposite ends of said arm members and including movable positioning means responsive to a connected rotated drive shaft, said positioning means being engaged with said unsecured opposite end portions in a manner adapted when connected to an appropriate said drive shaft to laterally position said secured outer end portions of said arm members according to the direction and amount of turning of such shaft; and

d. a drive shaft having one end adapted to be intra-orally placed and connected to drive said movable positioning means and an opposite end adapted to be intra-orally placed and adapted for finger engagement to turn said drive shaft to effect desired positioning of said arm members and thereby achieve corrective positioning of said bone.

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**3,895,625**

## HEAD PROTECTION ENCLOSURE

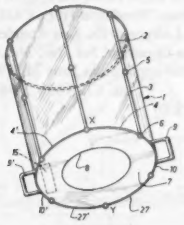
**René Delest, Meudon, France, assignor to S.A. Ulmer Aeronautique, Paris, France**

**Filed Feb. 28, 1974, Ser. No. 447,024**

**Claims priority, application France, Mar. 1, 1973, 73.07287**

**Int. Cl. A61m** *15/00*

**U.S. Cl. 128—142** **10 Claims**



1. An insulating, heat-resistant and translucent enclosure intended to ensure protection of the head and to be completely closed to the atmosphere and to any source of fresh oxygen when worn on the wearer's head, at least one part of said enclosure being elastically deformable and provided with a means of passage for the wearer's head, said passage means being adjustable to insure the tightness about the wearer's neck, said enclosure being folded in vacuum, handle means associated with said enclosure for facilitating the unfolding of said enclosure, and regeneration means provided inside said enclosure for regenerating the air delivered by the wearer's breath to provide oxygen therefrom and to fix the carbonic anhydride.

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**3,895,626**

## APPARATUS FOR SPONTANEOUS OR ARTIFICIAL RESPIRATION

**Stig Olof Elfstrand, Hertigvagen 6, 126 52 Hagersten, Sweden**

**Filed Apr. 25, 1974, Ser. No. 464,097**

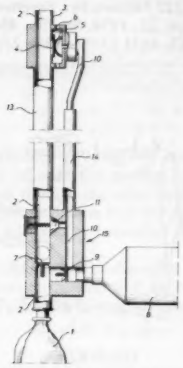
**Claims priority, application Sweden, Apr. 27, 1973, 7305991**

**Int. Cl. A61m** *16/00*

**U.S. Cl. 128—145.8** **5 Claims**

1. In an apparatus for spontaneous or artificial respiration having an attachment (1) for a gas source, a valve system (15), a flexible bladder (8) for respiratory gas connected to the attachment (1) via the valve system, and a mouth valve (3) having an expiratory valve (4), said mouth valve being connected to means engagable with a patient to direct gas into the respiratory system and being connected to the valve system (15) via a hose (13), the improvements comprising:

a. bladder (8) connected via a channel (10) and a flexible hose (14) to a closed chamber, containing a diaphragm (5), in the mouth valve (3), said diaphragm (5) being operatively associated with said expiratory valve such that, when the pressure in said bladder (8) exceeds the



pressure in said valve system, the diaphragm (5) expands and preloads the expiratory valve (4); means communicating the bladder (8) to the hose (13) between the mouth valve (3) and the valve system, such that when the pressure in said bladder exceeds the pressure in said valve system, the means allows a one-way communication between the bladder (8) and said hose (13) and wherein said means is adjustable.

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**3,895,627**

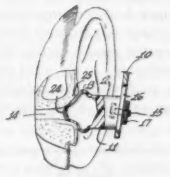
## EAR PROTECTOR

**Howard S. Leight, 16027 Northfield St., Pacific Palisades, Calif. 90272**

**Division of Ser. No. 164,609, July 21, 1971, Pat. No. 3,768,470. This application June 21, 1973, Ser. No. 372,168The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.**

**Int. Cl. A61f** *11/02*

**U.S. Cl. 128—152** **2 Claims**



1. An ear protector comprising:

a pair of sound-attenuating pods and means for holding said pods against the ears of a wearer;

each pod being of generally cylindrical shape and having a base portion attached to said holding means and a tip portion adapted to enter the ear canal, at least one side of said tip portion bulging so that it extends radially beyond the boundaries of the base portion and said tip portion forming a smooth continuous curve along the bulging portion and up to the extreme tip of the pod, said pod being solid up to a region near the beginning of said bulging tip portion and said tip portion being hollow and

of soft resilient material so that said bulging portion can readily deform against the region of the ear surrounding the ear canal to thereby form a good sound-tight seal therewith.

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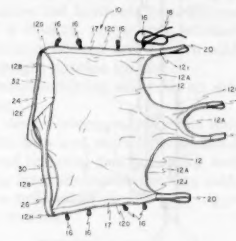
**3,895,628**

## BODY ENCOMPASSING BANDAGE PROTECTOR FOR DOGS AND OTHER SUCH ANIMALS

**Georga Ann Adair, 322 Milburn Dr., Fayetteville, N.C. 28304**

**Filed Mar. 25, 1974, Ser. No. 454,072**
**Int. Cl. A61f** *13/00*; **A01k** *21/00*
**U.S. Cl. 128—171** **11 Claims**



1. A body encompassing bandage protector for animals comprising:

a. a main body encompassing covering means for encompassing a substantial area of an animal's body and for protecting a bandage thereunder;

b. said main body encompassing covering means having two separable terminal side edges that allow said main body encompassing covering means to be directly placed about the body of said animal;

c. said main body encompassing means further including front and rear boundaries that extend between said separable terminal side edges and across respective front and rear end portions of said main body encompassing covering means;

d. means for interconnecting said two separable terminal side edges such that said main body encompassing covering means is securedly held about the animal's body;

e. front loop connecting means integrally connected to the front portions of said main body encompassing covering means for attaching to a collar like member normally secured around the animal's neck; and

f. a pair of cross straps integrally connected to the rear portion of said main body encompassing covering means, each cross strap extending from an intermediate rear area of said body covering means across the other cross strap and integrally connected to an outer portion of said main covering means such that the crossing straps define a central tail opening and a leg opening on each side thereof.

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**3,895,629**

## MEDICAL INSTRUMENT RETAINER

**Elizabeth M. Snyder, 1763 S. Heather Ln., Anaheim, Calif. 92802**

**Filed Oct. 15, 1974, Ser. No. 514,655**
**Int. Cl.[2] A61F** *13/00*; **A61M** *25/02*
**U.S. Cl. 128—171** **7 Claims**

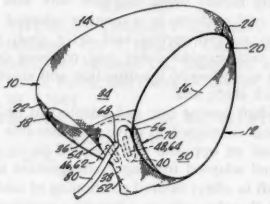
1. A medical instrument retainer comprising

a first bifurcated panel having first and second mutually spaced branches defining a first open-ended slot therebetween,

a second bifurcated panel having third and fourth mutually spaced branches defining a second open-ended slot therebetween,

each said slot terminating in a bight inwardly of said panel,

means on said branches for detachably connecting said first branch to said third branch and said second branch to said fourth branch in respective overlapping relation, said panels being oppositely oriented relative to each other along the longitudinal extent of the slots to define



a gripping aperture between the bights and connected overlapping branches of said panels, whereby said retainer may be positioned with said gripping aperture circumscribing an instrument that extends from a body aperture without removing the instrument from the body aperture and without disconnecting the instrument from other apparatus to which it may be connected.

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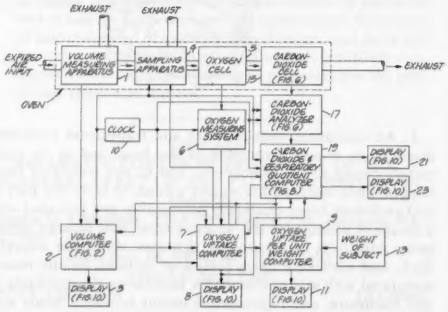
**3,895,630**

## RESPIRATORY GAS ANALYZER INCLUDING A CARBON DIOXIDE AND RESPIRATORY QUOTIENT COMPUTER

**John A. Bachman, Woodland Hills, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 366,696, June 4, 1973, abandoned. This application June 21, 1974, Ser. No. 481,517**
**Int. Cl. A61b** *5/08*
**U.S. Cl. 128—2.07** **13 Claims**




1. Apparatus for automatically periodically measuring the volume of air expired by a subject during each of a succession of given time intervals, and for measuring and computing the carbon dioxide production in the expired air for each of the time intervals, said apparatus including: metering means for receiving the expired air from the subject and for generating electrical output pulses having a repetition frequency representative of the volume of air expired by the subject during successive time intervals and under standard temperature conditions; volume computer means including multiplier circuit means coupled to said metering means for multiplying each pulse of the electrical output pulses therefrom by a predetermined number, and further including divider circuit means coupled to said multiplier circuit means for subsequently dividing the pulses from said multiplier circuit means by a predetermined number, so as to compute the volume of air expired by the subject during each of time intervals corrected to body temperature conditions and to produce electrical output pulses representative of the corrected volume;

sampling means coupled to said metering means for extracting a sample of the expired air therefrom having a proportionate relationship to the total volume of air expired by the subject during each of the given time intervals; carbon dioxide measuring means coupled to said sampling means for measuring the concentration of carbon dioxide in each sample of the expired air and for producing output electrical pulses having a repetition frequency representative of the concentration of carbon dioxide in each such sample; and carbon dioxide computer means coupled to said carbon dioxide measuring means and to said volume computer means and including multiplying circuit means for multiplying the output pulses from the carbon dioxide measuring means with the output pulses from the volume computer means to produce electrical output pulses representative of the carbon dioxide production in the expired air of the subject for each given time interval.

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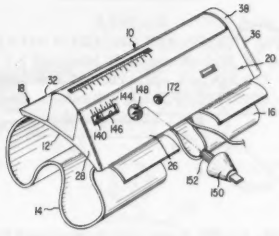
**3,895,631**

## LIQUID INFUSION UNIT

**Richard G. Buckles, Menlo Park; Seymour Hoff; Sharon Kehr, both of San Jose, and Su Il Yum, Mountain View, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.**

**Filed Feb. 4, 1974, Ser. No. 439,137**
**Int. Cl. A61m** *5/14*
**U.S. Cl. 128—213** **27 Claims**




1. A liquid storing and dispensing assembly comprising:
a main housing;
a liquid flow passage in said main housing having inlet and outlet means, said outlet means communicating exteriorly of said housing;
flow control means in said housing between said inlet and outlet means for precisely controlling liquid flow through said passage;
a cartridge removably engaged with said housing the exterior of said cartridge cooperating with the exterior of said main housing such that the assemblage has a contiguous exterior surface, said cartridge including a repository for a quantity of liquid to be dispensed; and
said inlet means cooperating with said cartridge to establish communication between said repository and said passage when said cartridge in engaged with said housing.

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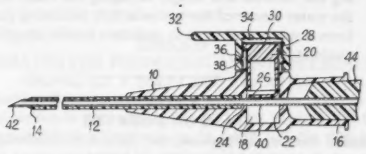
**3,895,632**

## TROCAR CATHETER

**Leopold Plowiecki, Montmorency, France, assignor to Technological Supply S.A., Luxemburg**

**Filed Feb. 11, 1974, Ser. No. 441,494**
**Claims priority, application France, Mar. 6, 1973, 73.07873**
**Int. Cl.[2] A61M** *5/00*
**U.S. Cl. 128—214.4** **6 Claims**

1. An intravenous catheter and terminal connector therefor having a longitudinal axis, said connector having a chamber transversely disposed to the longitudinal axis, said chamber having a single inlet in one wall of the chamber and a single outlet in an opposite wall of the chamber, and an obturating plug rotatably disposed in said chamber to control the inlet and outlet, the improvement comprising:
a flexible extension integrally formed on a lower portion of said plug and being rotated therewith between operative and intermediate positions,
said flexible extension being rotated with said plug to its intermediate position between the said one wall and the said opposite wall of the chamber whereby a liquid may flow through the chamber,




said flexible extension abutting said one wall to cover the inlet when in its operative position to prevent a reverse flow of liquid through the inlet, said flexible extension being deflected away from said one wall by liquid passing through the inlet and by a member inserted through the inlet, and
said inlet and outlet being in alignment with said longitudinal axis whereby the member may be inserted therethrough and protrude through the catheter.

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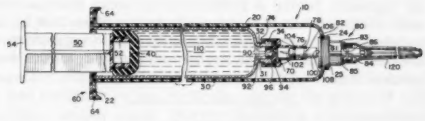
**3,895,633**

## LARGE CAPACITY SYRINGE

**Elliot Bartner, South Piscataway, N.J.; Edward M. Curley, Silver Spring, Md.; Sheldon Kaplan, Potomac, Md., and Stanley J. Sarnoff, Bethesda, Md., assignors to Survival Technology, Inc., Bethesda, Md.**

**Filed Sept. 27, 1973, Ser. No. 401,272**
**Int. Cl. A61m** *5/26, 5/32*
**U.S. Cl. 128—218 DA** **6 Claims**



1. A syringe adapted to inject substantial amounts of medicament, said syringe comprising a cylindrical syringe barrel having a rear open end and a forward end provided with internal threads, a cylindrical cartridge body slidably carried within said barrel, said cartridge body having a rear open end and a necked portion at the forward end, a plunger slidably carried within the cartridge body, a stopper mounted in the necked end of the cartridge body to form a closed medicament chamber between said stopper and the plunger, retaining means on the rear end portion of the syringe barrel to retain the cartridge body within the barrel and the plunger within the cartridge body, the improvement comprising:
a cannula mounting body member having a threaded section threadedly engaging the internal threads on the forward end of the syringe barrel so as to fixedly position said body member in the forward end of said barrel, a needle support integral with and extending rearwardly from the cannula mounting body member, a hollow needle affixed to the needle support with its free end spaced from the cartridge stopper, cooperating means on the necked portion of the cartridge and the needle support to provide sterility of the needle and to maintain relative position of the needle with respect to the cartridge stopper, a cannula hub mounting portion integral with and extending forwardly from the body member, said cannula hub mounting portion comprising an integral forwardly extending outer sleeve having internal threads thereon,

an integral inner sleeve within said outer sleeve, a cannula having a hub with an annular peripheral flange thereon, the cannula hub fitting over the inner sleeve with the hub flange engaging the internal threads on the outer sleeve, a passage connecting the needle and the cannula, said inner sleeve forming a portion of the passage connecting the needle and the cannula, and a cannula sheath covering the cannula and snugly engaging the outer surface of the outer sleeve of the cannula hub mounting portion to form a sterile seal so as to maintain sterile integrity of the cannula.

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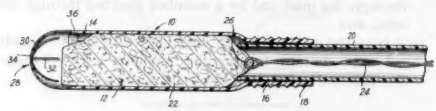
**3,895,634**

**TAMPON INSERTER**

**Leonard Berger, Ridgewood, and Robert A. Underhill, Ringwood, both of N.J., assignors to Rapid-American Corporation, New York, N.Y.**

**Filed Oct. 18, 1973, Ser. No. 407,711**
**Int. Cl. A61f** *15/00*
**U.S. Cl. 128—263** **21 Claims**



1. A tampon inserter comprising a barrel member adapted to contain a tampon and an ejection means in telescoping relation with said barrel member, said barrel member having a substantially cylindrical, hollow tubular body and a tapered front insertion end comprising a plurality of resilient substantially triangular segments having their bases integral with said tubular body and their sides and apexes converged toward each other to form said insertion end, said tubular body having a predetermined mean cross-sectional wall thickness sufficient to provide wall stability to said tubular body and said triangular segments having a predetermined mean cross-sectional wall thickness which is substantially less than that of said tubular body such that the flexibility of said segments is increased while the overall strength and stability of the major portion of said tubular body is maintained.

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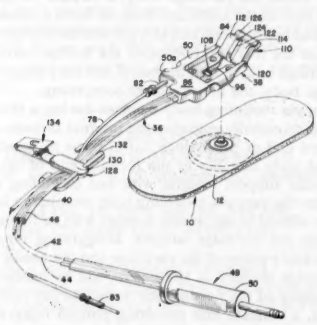
**3,895,635**

**ELECTROSURGICAL GROUNDING CABLE ASSEMBLY**

**George Junior Justus, York Haven, Pa.; Lowell C. Miller, Lewisburg and Charles T. Patrick, Jr., Centerville both of Ohio, assignors to NDM Corporation, Dayton, Ohio**

**Filed June 20, 1973, Ser. No. 371,773**
**Int. Cl. A61n** *1/04*
**U.S. Cl. 128—303.13** **21 Claims**



1. For use with electrosurgical equipment including (a) an electrosurgical generator for generating high frequency electric current, (b) an active electrode electrically connected to said generator and used to cut tissue and coagulate blood, and (c) an indifferent electrode for attaching to a patient an electrical ground means, a grounding assembly suitable for said electrosurgical equipment and comprising, in combination, a connector and a cable, said connector, in turn, comprising a body provided with a slot defining an open trackway along a face of said body for receiving, on one end of the trackway, a conductor electrically coupled to said indifferent electrode, and means at the opposite end of the trackway for terminating the trackway while still retaining said conductor on said trackway, an electrically conductive contact means, carried by said body, electrically coupled with said conductor on said trackway, while said conductor is in said trackway, and with one end of the cable, the opposite end of said cable being electrically coupled to ground, and locking means carried by said connector and positionable in said trackway to lock said conductor in electrical contact with said contact means.

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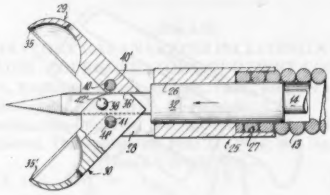
**3,895,636**

**FLEXIBLE FORCEPS**

**William Schmidt, 42-49 Colden St., Flushing, N.Y. 11355**

**Filed Sept. 24, 1973, Ser. No. 400,340**
**Int. Cl. A61b** *17/32, 17/34, 17/28*
**U.S. Cl. 128—305** **9 Claims**



1. Flexible forceps comprising an elongated flexible tubular member having proximal and distal ends, a flexible element extending through and slidably disposed within said tubular member, the distal end of said tubular member including a jaw assembly comprising a sleeve secured to and extending from the end of said tubular member, a trocar assembly including a cylindrical member slidably disposed within said sleeve and secured to the distal end of said flexible element, a trocar carried by said cylindrical member and extending therefrom, a pair of hollow hemispherical jaws each having a rearwardly extending supporting member, means pivoting the supporting members to said sleeve for movement of the jaws between open and closed positions, means coupling said supporting members to said trocar assembly so that movement of said assembly in one direction will open said jaws and movement in the other direction will close said jaws and means on the proximal end for moving said flexible element relative to said tubular member.

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**3,895,637**

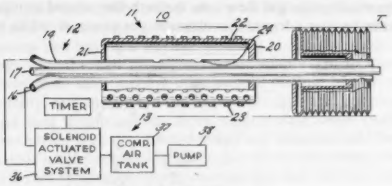
**SELF PROPELLED CONDUIT TRAVERSING DEVICE**

**Daniel S. J. Choy, 892 Riverbank Rd., Stamford, Conn. 06903**

**Filed Oct. 19, 1973, Ser. No. 408,138**
**Int. Cl. A61m** *25/00;* **A61b** *19/00*
**U.S. Cl. 128—348** **8 Claims**

7. A self propelled conduit traversing device comprising a longitudinally extending flexible tubular member having first and second lumens, an inflatable transversely expandable anchor member connected to said tubular member and communicating with said first lumen, an inflatable advancing member connected to said tubular member and communicating with said second lumen and including a transversely expandable first section and a longitudinally expandable second section in free fluid communication with said first section and

upon inflation of said advancing member, said second section expanding subsequent to the expansion of said first section, said advancing member including a front wall affixed to said tubular member and a rear wall having a central opening and an axially extending elastomeric tube having a rear end joined to the border of said opening and a front end secured to said




tubular member proximate said front end wall, said elastomeric tube surrounding and being radially spaced from said tubular member, and actuating means for connecting said first and second lumens to a source of pressurized fluid and exhaust in a predetermined sequence to expand and deflate said anchor member, and advancing member in accordance with said sequence.

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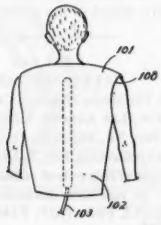
**3,895,638**

**SPINAL COLUMN WARMING TREATMENT APPARATUS**

**Tadao Ito, 7-1.8 Bangochi, Hanazono-imachi, Kyoto, Japan**

**Filed Feb. 28, 1974, Ser. No. 446,613**
**Claims priority, application Japan, Mar. 4, 1973, 48-25449**
**Int. Cl. A61n** *5/00*
**U.S. Cl. 128—379** **14 Claims**



**1.** A spinal column warming treatment apparatus for selectively and locally warming a predetermined region opposing a spinal column in the back of a human body to a predetermined warming temperature in the range of 40° to 70°C, said predetermined region having a width of from to 3 to 7 cm and a length of from 30 to 90 cm; said apparatus comprising a warming means comprised of a fixing sheet, and a heater means affixed to said fixing sheet and distributed throughout an area on said fixing sheet corresponding to said predetermined region, said heater means further extending back and forth on said fixing sheet in the lengthwise direction thereof and being laid flat on said fixing sheet, said heater means comprising a heating wire, a signal wire, and a heat sensitive layer between said heating wire and said signal wire, means for retaining said warming means adjacent said predetermined region in the back of a human body, comprising an elastic sheet member, an elastic elongated protrusion formed in the region of said sheet member corresponding to said predetermined region in the back of a human body, and a cover covering said elastic sheet member and protrusion, said fixing sheet being affixed to said elastic sheet member underneath said cover at both sides of said heater wire with said heater wire being positioned on and aligned with said elastic elongated protrusion, means for automatically controlling the heating temperature of said heating wire comprising means for controlling the energization of said heating wire in response to the impedence through said heat sensitive layer between said heating layer and said signal wire, said heat sensitive layer having an impedence that changes as the function of the temperature of said warming means, and means for selectively setting said automatic control means for controlling the temperature of said warming means within said range of 40° to 70°C.

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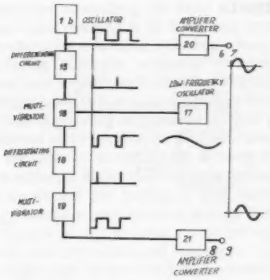
**3,895,639**

**APPARATUS FOR PRODUCING AN INTERFERENCE SIGNAL AT A SELECTED LOCATION**

**Hans Rodler, Karntnerstrasse 161, A-8053 Graz, Austria**

**Continuation-in-part of Ser. No. 178,159, Sept. 7, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,067**
**Int. Cl. A61n** *1/36*
**U.S. Cl. 128—422** **9 Claims**




**1.** Apparatus for producing an interference signal at a selected location comprising, in combination, oscillator means for furnishing an oscillator output signal having a determined frequency and a reference phase; phase shift means connected to said oscillator means cyclically varying the phase of said oscillator output signal, thereby furnishing a phase-shifted oscillator output signal; first electrode means connected to said oscillator means for creating a first current having said determined frequency at said selected location in response to said oscillator output signal; and second electrode means connected to said phase shift means for creating a second current having said determined frequency and a phase varying cyclically with respect to the phase of said first current at said selected location in response to said phase-shifted oscillator output signal, whereby interference between said first and second currents creates said interference signal at said selected location.

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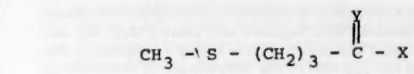
**3,895,640**

**COMPOSITIONS AND METHODS UTILIZING THIO DERIVATIVES AND PROCESSES FOR PRODUCING SUCH DERIVATIVES**

**Alan O. Pittet, Atlantic Highlands; John V. Pascale, Jackson, both of N.J.; Stuart Patton, State College, Pa., and Michael H. Brodnitz, Matawan, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

**Division of Ser. No. 301,524, Oct. 27, 1972. This application Mar. 29, 1974, Ser. No. 455,986**
**Int. Cl.[2] A24B** *15/04*
**U.S. Cl. 131—17 R** **7 Claims**

**1.** A flavored tobacco or tobacco substitute product comprising tobacco or a tobacco substitute and a fruit flavor altering amount of at least one 4-(methylthio)-butane derivative having the formula



wherein X is hydrogen and Y is carbonyl oxygen; X is hydroxy and Y is two hydrogen atoms or a carbonyl oxygen; or X is lower alkoxy and Y is (a) carbonyl oxygen or (b) hydrogen and lower alkoxy, the alkoxy groups containing from one to three carbon atoms, the flavoring constituting approximately 0.01 ppm to about 200 ppm of the composition.

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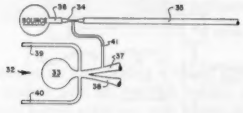
**3,895,641**

## FLUID SYSTEM AND METHOD FOR CODING INFORMATION

**Stephen C. Jacobsen, 839 E. South Temple, Salt Lake City, Utah 84122**

**Filed Aug. 28, 1968, Ser. No. 756,037**
**Int. Cl. F17d** *3/02*
**U.S. Cl. 137—1** **13 Claims**



9. A method for coding information which comprises the steps of selecting a plurality of diverse fluids to be non-miscible under the conditions of their use;

feeding said fluids into a small diameter data storage line such that one fluid serves as a data separation fluid to separate bits of data and a characteristic of at least one other of the said fluids is indicative of data bits;

removing the line such that additional fluids are not fed thereinto and maintaining the fluids fed into the line in their positions in which they are fed thereinto; and

thereafter detecting the relative positions of the fluids in the line as being indicative of information provided by the data bits.

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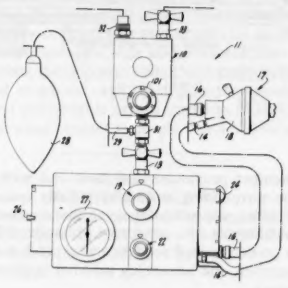
**3,895,642**

## METHOD AND APPARATUS FOR MIXING GASES

**Forrest M. Bird, and Henry L. Pohndorf, both of Sandpoint, Idaho, assignors to Bird Corporation, Palm Springs, Calif., a part interest**

**Continuation of Ser. No. 316,849, Dec. 20, 1972, abandoned, which is a division of Ser. No. 54,934, July 15, 1970, Pat. No. 3,727,627. This application Jan. 21, 1974, Ser. No. 435,320**
**Int. Cl. G05d** *11/03*
**U.S. Cl. 137—7** **2 Claims**

1. A method for mixing gases from separate pressurized gas circuits in a gas mixing device having a differential gas mixing valve, the gas mixing valve having a pair of orifices opening through a mixing chamber, comprising the steps of controlling the gas flow in each circuit at a respective flow control location, sensing the gas pressure in each circuit at a respective zone downstream of each control location, each zone being in a path which leads without branching from said control location to said gas mixing valve, detecting an imbalance between the downstream pressures at said zones of the two circuits, increasing the gas flow rate through the control location having a lower downstream gas pressure while simultaneously decreasing the gas flow rate through the control location having the higher downstream gas pressure, directing the downstream gases in each circuit across a second flow control location in each of said circuits, sensing the gas pressure in each circuit at a second respective zone downstream of said second control location, each second zone being in a path which leads without branching from said second control location to said gas mixing valve, detecting an imbalance between the pressures downstream of said second control location, increasing the gas flow rate through the second control location having a lower downstream gas pressure while simultaneously decreasing the gas flow rate through the second control location having a higher downstream gas pressure to bring said last mentioned pressures into balance, directing the gas flows from the second zones downstream of the second control locations in respective paths leading across said orifices into the mixing chamber in said differential mixing valve, and reciprocally varying the flow areas of respective orifices to selectively vary the ratio of gas flow rates from the separate circuits which are mixed in the mixing chamber.



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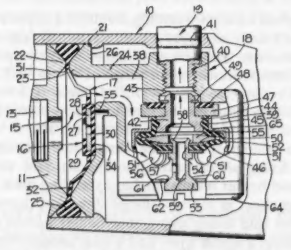
**3,895,643**

## VALVE ASSEMBLY

**Irving A. Ward, Hacienda Heights, Calif., assignor to Modern Faucet Mfg. Co., Los Angeles, Calif.**

**Division of Ser. No. 868,526, Oct. 22, 1969, Pat. No. 3,602,244. This application July 2, 1971, Ser. No. 159,493The portion of the term of this patent subsequent to Aug. 31, 1988, has been disclaimed.**
**Int. Cl. F03c** *1/04*; **F16k** *31/14 B*
**U.S. Cl. 137—119** **2 Claims**



1. A spout assembly comprising:

spout means having a passageway therethrough, said passageway having an inlet and an outlet,

partition means mounted in the inlet of said spout means, said partition means being adapted to be coupled to a fluid supply and having an opening therein communicating with the passageway in said spout means,

means defining a drain outlet, said drain outlet being disposed within said passageway and being in axial alignment with said opening in said partition means,

valve inlet means disposed within said passageway, said inlet being adapted to communicate with said opening in said partition means,

flexible anti-siphon valve means mounted within said spout means between said opening in said partition means and said drain outlet for normally closing said opening in said partition means when no fluid is supplied to said assembly, said anti-siphon valve means including a diaphragm normally biased to close said opening in said partition means and having a flexible webbing portion with openings therethrough for allowing said diaphragm to move away from said opening upon supply of fluid to said assembly, said supply of fluid to pass through said openings and said diaphragm to move against said drain outlet preventing fluid flow therethrough and directing said flow to said valve inlet means, said valve means including a rim and said flexible portion intercoupling said rim and said diaphragm, and

retaining means coupled with said rim for maintaining said valve means within said spout means.

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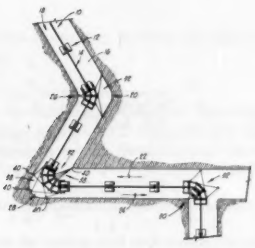
**3,895,644**

## TURNING CONVEYOR FOR A FLEXIBLE HOSE SUPPORTING SYSTEM

**Ronald W. Umphrey, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed May 15, 1974, Ser. No. 470,068**
**Int. Cl. B65g** *53/30*
**U.S. Cl. 137—344** **8 Claims**



1. In a supporting system for flexible hose which includes at least one flexible hose supported by a plurality of carts linkingly spaced along the length of the hose and pivotally interconnected, and wherein the hose is required to be moved through a determined angle of turn, the improvement comprising:

a conveyor assembly comprising:

a frame;

a plurality of vertical support rollers connected to the frame, said rollers forming a planar surface of support for the slack regulating system;

a plurality of outer horizontal guide rollers connected to the frame at spaced-apart points along an outer guide curve;

a plurality of inner horizontal guide rollers connected to the frame at spaced-apart points along an inner guide curve, the inner guide curve being curvilinearly parallel to the outer guide curve; and,

anchor means securing said conveyor assembly in a stationary position.

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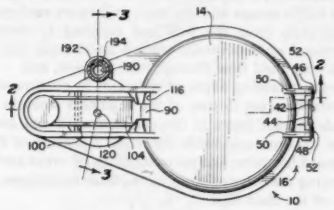
**3,895,645**

## FLUID LEVEL CONTROL VALVE

**Dwight N. Johnson, Anaheim, Calif., assignor to JH Industries, Inc., Santa Ana, Calif.**

**Filed Mar. 9, 1973, Ser. No. 339,548**
**Int. Cl. F16k** *31/34*
**U.S. Cl. 137—403** **29 Claims**



1. Apparatus for controlling the level of liquid in a tank having a liquid inlet opening in its floor, said apparatus comprising in combination a housing including a body and a cover having interfacing generally uniplanar surfaces defining a valve chamber and a diaphragm chamber therebetween, said body including a valve seat in said valve chamber generally in the plane of said interfacing surfaces, an integral projection of said body adapted to be received in the liquid inlet opening in the floor of the tank for mounting the housing in a normally submerged position, a liquid inlet passage defined at least in part by said projection and leading to said valve seat, liquid outlet passage means in said housing leading from said valve seat to the exterior of said housing, an air passage defined at least in part by said projection and leading to said diaphragm chamber, a diaphragm in said diaphragm chamber having its periphery sealingly engaged between said interfacing surfaces, a flexible valve member in said valve chamber having its periphery held between said interfacing surfaces, a pressure sensing passage in said cover leading from the exterior of said housing to said diaphragm chamber, said diaphragm being interposed in said diaphragm chamber between said air passage and said pressure sensing passage, and operating means for moving said valve member relative to said valve seat in response to movement of said diaphragm.

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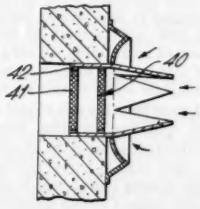
**3,895,646**

## SELF-REGULATING VANE TYPE VALVE FOR CONTROLLING FLUID FLOW

**Manuel G. Howat, 24 Douglas St., Victoria, British Columbia, Canada**

**Filed Nov. 30, 1973, Ser. No. 420,552**
**Int. Cl. F16k** *17/38*
**U.S. Cl. 137—468** **5 Claims**



1. A fluid flow control system comprising:

a. means defining a fluid flow passage through a wall and having an inlet and outlet respectively on opposite sides of the wall;

b. a baffle circumscribing said inlet of the passage and having a concave inner surface extending outwardly in a direction away from the wall from immediately adjacent

the inlet for directing fluid flow inwardly in a direction toward the axis of the inlet;

c. a fluid flow control device mounted in said inlet consisting of a generally conically shaped segmental valve comprising a plurality of resiliently flexible triangular shaped segmental vanes secured along one edge thereof to said fluid flow passage defining means in contiguous relation around the periphery of the inlet adjacent the juncture of the baffle means and the inlet, said vanes each projecting outwardly from the wall and tapering to provide free terminal ends normally spaced apart from one another allowing fluid flow through said passage; and

d. means retaining edges of segments in continuous rolling contact during flexing of the segments wherein the free ends thereof move in directions toward and away from one another, said baffle directing a portion of fluid flow toward the valve against outer faces of vanes and thereby varying the valve opening in response to changes in velocity of the fluid flow.

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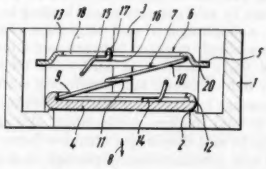
**3,895,647**
**VALVE**

**Helmut Willenbrock, Achim, and Friedrich Schittek, Bremen, both of Germany, assignors to Gustav F. Gerdts KG, Bremen, Germany**

**Filed Jan. 21, 1974, Ser. No. 435,379**
**Claims priority, application Germany, Jan. 23, 1973, 2303053**
**Int. Cl.² F16K** *15/00, 17/04*
**U.S. Cl. 137—529** **11 Claims**



**1.** A valve controlled by the fluid pressure of medium passing through comprising:

a housing having an input opening defining a valve seat;

a locking member movably disposed over the opening of the housing and positioned on the valve seat;

an abutment member disposed in said housing substantially parallel to and axially spaced from said locking member;

a plurality of springs in the form of substantially V-shaped bars having shanks, each spring having one end pivotably clamped to said abutment member, and its other end pivotably clamped to said locking member at a position substantially **180°** with respect to said one end, said shanks of each of said springs defining a plane in which said each of said springs extends substantially laterally across the complete width of said members, said springs being spaced apart from the axis of said valve, said springs being axially tensioned, so that when fluid pressure reaches a predetermined level the locking member axially lifts off said valve seat in a direction towards said abutment member, causing said springs to approach a parallel orientation with respect to said members, thereby reducing the axial vector force component of the springs in the direction of the stroke movement, causing a positive snap-open valve action.

**10.** A valve controlled by the pressure of medium passing through comprising:

a housing having an input opening defining a valve seat and having an inside wall formed with a plurality of axial ribs, each of said ribs having a radial groove;

a locking member disposed over the opening of the housing and positioned on the valve seat;

an abutment disposed in said housing and retained by said radial grooves;

a plurality of spring bars each angularly arranged in said housing and each having one end pivotably clamped to said abutment and having its other end pivotably clamped to said locking member, said spring bars being axially tensioned and each defining a plane inclined with respect to the said locking member, and said abutment;

at least one of said spring bars including means defining a bent hook portion adapted for engagement with one side of said ribs to maintain said abutment against turning, whereby when pressure of the medium reaches a predetermined level the locking member axially lifts off said valve seat in a direction towards said abutment causing said spring bars to approach a parallel orientation with respect to said locking member and said abutment and reducing the axial vector force component of the spring bars in the direction of the stroke movement causing a positive snap-open valve action.

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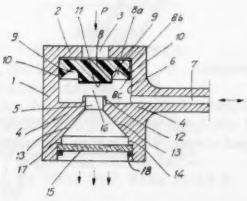
**3,895,648**
**VALVES**

**Kurt Stoll, Lenzhalde, Esslingen a.N., and Gerhard Hihn, Schurwaldstr. 7, Berkheim, both of Germany**

**Filed Jan. 9, 1974, Ser. No. 431,854**
**Claims priority, application Germany, Jan. 17, 1973, 7301612**
**Int. Cl.² F16K** *15/02*
**U.S. Cl. 137—550** **1 Claim**

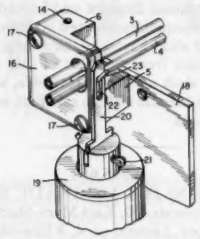


**1.** A quick-acting air relief valve which incorporates a valve casing with a cylindrical chamber having an inlet opening for connection to a pneumatic source, a vent opening for connection to atmosphere, and a transverse bore which ends in the chamber for connection to an air-operated device, and which also contains a valve member which is displaceable inside the chamber and has in its underside, which is remote from the inlet opening, an annular groove of curved cross-section which opens conically outwards, providing the valve member with an annular lip which rests elastically against the inner wall surface of the cylinder, and, at the underside of the valve member, a valve sealing member, the casing having, projecting into the chamber around the vent opening, a collar-shaped connection which is engageable by the sealing member and serves as a valve seat surrounding the vent opening, a funnel-shaped, conical, widened section adjacent to and communicating with the vent opening and a filter of a porous, sound-absorbing material in the zone of the largest cross-section of the widened section.

## 3,895,649
## ELECTRIC HOSECOCK

**Samuel B. Ellis, Lindenhurst, N.Y., assignor to Delta Scientific Corporation, Lindenhurst, N.Y.**

**Filed June 19, 1974, Ser. No. 480,959**
**Int. Cl. F16k** *7/06*
**U.S. Cl. 137—595** **6 Claims**



1. A hosecock for controlling the flow of a fluid in a flexible tube, comprising:
a. a body;
b. a jaw supported in said body;
c. arm means for defining a channel for receiving the tube, said arm means being spaced from said jaw and adapted to be displaced by an electromechanical operator, said channel being defined between said jaw and said arm means;
d. a plug rotatably mounted in said body adjacent said arm means;
e. spring means for urging said arm means toward said jaw to pinch said tube, said spring means being secured to said arm means and plug and disposed around and secured to said plug and being put in torsion by angular displacement of said plug; and
f. means for setting said plug in a desired angular position.

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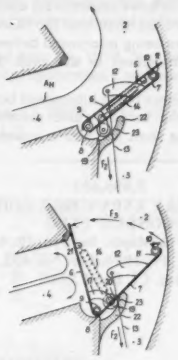
## 3,895,650
## SHUTTER-TYPE FLUID DISTRIBUTOR

**Jean Cadiou, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France**

**Filed Mar. 12, 1974, Ser. No. 450,446**
**Claims priority, application France, Mar. 21, 1973, 73.10107**
**Int. Cl. F74f** *13/04*
**U.S. Cl. 137—612** **9 Claims**

1. A fluid distributor comprising:
a housing having therein three ducts angularly spaced from each other;
a shutter comprising two substantially parallel flap-valves pivotally mounted about a common axis in said housing; said two flap-valves being selectively movable from a first position blocking a first of said ducts to a second position blocking a second of said ducts; and
means operatively connected with said shutter for causing said two flap-valves, when in one of said first and second



positions, to block the respective one of said first and second ducts and to simultaneously block said third duct.

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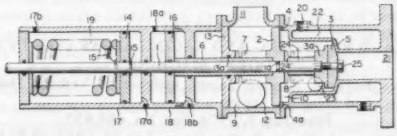
## 3,895,651
## COMPOUND ASEPTIC VALVE

**Katsuto Okada; Akichika Ishibashi, and Hirotaka Watanabe, all of Tokyo, Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan**

**Filed May 16, 1974, Ser. No. 470,618**
**Claims priority, application Japan, July 12, 1973, 48-83037**
**Int. Cl. F16k** *1/00*
**U.S. Cl. 137—630.22** **5 Claims**



1. A compound aseptic valve comprising:
a. a valve housing having two ports spaced from each other and defining a valve chamber between the ports;
b. a first valve seat and a second valve seat spaced from each other in the valve chamber between the ports;
c. an elongated valve shaft mounted in the valve housing and extending into the valve chamber;
d. a sleeve slidably mounted on the valve shaft;
e. first actuating means for axially moving the valve shaft;
f. second actuating means for axially moving the sleeve on the shaft;
g. first and second valve members mounted on the valve shaft,
1. the first valve member being arranged sealingly to engage the first valve seat in response to movement of the valve shaft in one direction by the first actuating means and thereby blocking a path in the valve chamber between the ports, and to be disengaged from the first valve seat in response to movement of the valve shaft in a direction opposite to the one direction by the first actuating means, and thereby opening the path between the ports, and
2. the second valve member being arranged sealingly to engage the second valve seat in response to movement of the sleeve in one direction by the second actuating means and thereby blocking the path between said

ports, and to be disengaged from the second valve seat in response to the movement of the valve shaft in the direction opposite to the one direction by the first actuating means; and

h. first and second bellows respectively enclosing a portion of the assembly of the shaft and the sleeve,

1. the first bellows being interposed between the first and second valve members in the axial direction of the shaft, and

2. the second bellows being interposed between the valve housing and the second valve member in the axial direction of the shaft and sleeve assembly.

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**3,895,652**

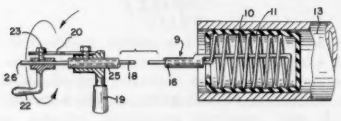
## DIAMETRICALLY EXPANSIBLE COIL SPRING CONDUIT PLUG

**Roger G. Zach, 4144 S. Maple, Berwyn, Ill. 60402**

**Filed Jan. 11, 1974, Ser. No. 432,567**

**Int. Cl. B65d** *59/02*

**U.S. Cl. 138—89** **4 Claims**




1. A conduit plug comprising:

diametrically expansible coil spring means;

means for sealingly enclosing said coil spring means and binding said coil spring means firmly against the walls of said conduit; and

means for securing said coil spring in diametrically expanded position such that said coil spring means plugs the conduit by binding against said means for sealingly enclosing said coil spring means and binding said coil spring means.

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**3,895,653**

## CARD REVERTING AND RACING APPARATUS IN A DOBBY MACHINE

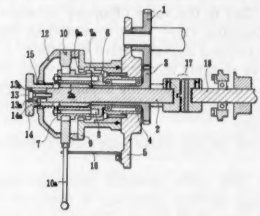
**Akira Koyama, Nagoya, Japan, assignor to Yamada Dobby Co., Ltd., Nagoya, Japan**

**Filed July 9, 1974, Ser. No. 486,937**

**Claims priority, application Japan, July 21, 1973, 48-81318**

**Int. Cl.[2] D03D** *51/00*

**U.S. Cl. 139—1 E** **13 Claims**



1. A card reverting and racing apparatus as utilized in connection with a card cylinder on a dobby machine, the combination comprising a shaft operatively connected to said card cylinder, a clutch sleeve rotatably mounted on said shaft, means defining a plurality of axial holes in said clutch sleeve, a drive shaft means operatively connected to said clutch sleeve for rotating the latter, a slide rotatably connected to said shaft and longitudinally slidable on said shaft, pins on said slide, lever means operably connected to said slide and operable to longitudinally slide said slide on said shaft upon pivotal movement of said lever means, said slide having a first longitudinal position in which said pins are inserted in some of said holes in said clutch sleeve, said slide having a second longitudinal position in which said pins are withdrawn from said holes and said slide is rotatable relative to said clutch sleeve a limited amount to rotational displace said limited amount so that the pins may be subsequently inserted in different holes in said clutch sleeve, said slide having a third longitudinal position wherein said pins are free and clear of said clutch sleeve so that the slide and shaft are freely rotatable, said lever means being operable to slide said slide to said first, second, and third longitudinal positions.

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**3,895,654**

## BEARING MEANS FOR AUTOMATIC SHED LOOM

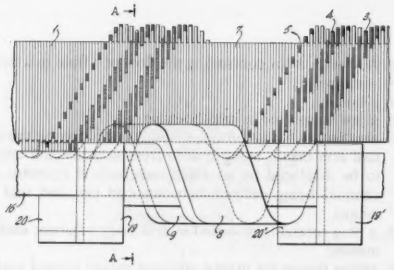
**Günter Welzel, Keplerstr. 50, Karl-Marx-Stadt, Germany, and Dair Ajmaletdinov, Lesnaja ul. 4, Klimovsk, U.S.S.R.**

**Filed Aug. 22, 1974, Ser. No. 499,694**

**Claims priority, application U.S.S.R., Nov. 21, 1973, 1967644**

**Int. Cl. D03d** *41/00*

**U.S. Cl. 139—12** **4 Claims**




1. In a multipe shuttle automatic shed loom, a rotatable weaving roll, the weaving roll comprising a shaft and mounted on the shaft a plurality of driving hooks having projections for driving the shuttles, the driving hooks being so arranged on the shaft that a helical recess is defined thereby, and bearing means for supporting the weaving roll at a location between the ends of the roll, the bearing means comprising backing rolls arranged on opposite sides of and equidistantly from an axial plane of the shaft of the weaving roll, each of the backing rolls being provided with a helical projection which engages in the helical recess defined by the driving hooks, the helical projections being of the same diameter as the helical recess.

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**3,895,655**

## HARNESS FRAME FOR LOOMS

**Thomas J. Sujdak, Webster, and Douglas W. Anderson, Westboro, both of Mass. 01581, assignors to Rockwell International Corporation, Pittsburgh, Pa.**

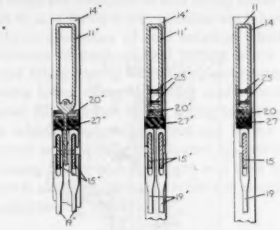
**Filed Apr. 12, 1974, Ser. No. 460,328**

**Int. Cl. D03c** *9/06*

**U.S. Cl. 139—92** **2 Claims**

1. An improved harness frame for looms comprising:

a. an upper and lower rail member;
b. stile members interconnecting the ends of said upper and lower rail members;
c. heddle bars supported by said stile members and disposed parallel with and adjacent the opposed sides of each said rail member for supporting a multiplicity of heddles therebetween; and



d. elongated rigid members extending parallel with an fixed to the opposed sides of said upper and lower rail members having a resilient member of conforming configuration attached to one surface of said rigid members for preventing oscillating movement of the heddles on said heddle bars during movement of the harness frame.

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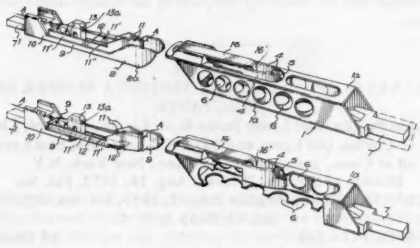
**3,895,656**

## WEFT TRANSFER MECHANISM FOR LOOMS FOR WEAVING

**Peter Stockport Allsopp, Halifax, N.Y., assignor to Wilson and Longbottom Limited, Barnsley, England**

**Filed Mar. 7, 1974, Ser. No. 449,037**
**Int. Cl. D03d** *47/20*
**U.S. Cl. 139—122 N** **7 Claims**



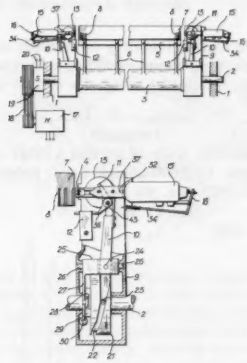
1. In a weft transfer mechanism for a loom for weaving wherein opposed rapier inserter and receiver heads are mounted for relative movement toward and from each other for moving a weft yarn through a shed in the loom, means for periodically driving the inserter head into and through the shed into coacting web transfer relation with the receiver head, a pair of spring jaws on the inserter head biased to closed condition for gripping the weft in the initial position of said inserter head, a pair of spring jaws on the receiver head biased to closed condition, cooperating formations on said spring jaws whereby during said driving movement said inserter head jaws with the weft gripped therebetween enter, separate and pass through said receiver head jaws which then reclose to grip the weft behind the inserter head jaws, means for returning the inserter head to its initial position, and cooperating formations on said spring jaws whereby on said return movement said inserter head jaws pass externally over said receiver head jaws to open said inserter head jaws to release the weft therefrom while the receiver head jaws retain their grip on the weft, means whereby said inserter head jaws are prevented from gripping the weft during return to said initial position, and means effective upon return of said inserter head jaws to said initial position for enabling said inserter head jaws to close on the weft.

**3,895,657**

## DEVICE FOR CONTROLLING GRIPPER SHUTTLE IN LOOMS

**Jan Bilek, Liberec, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi, Liberec, Czechoslovakia**

**Filed Apr. 16, 1974, Ser. No. 461,412**
**Claims priority, application Czechoslovakia, Apr. 18, 1973, 2774-73**
**Int. Cl. D03d** *47/24, 49/54, 51/40*
**U.S. Cl. 139—125** **3 Claims**



1. A device for controlling gripper shuttles in a loom having a rotary shuttle box at one side of the loom, the shuttle box having a shuttle-receiving guideway disposed parallel to the warp shed, comprising a control lever cooperating with the shuttle box, means mounting the control lever for swinging in both the perpendicular and longitudinal plane relative to the guideway of the shuttle box, two adjustable stops of unequal length extending parallel to the axis of rotation of the shuttle box and spaced in a direction transverse to said axis of rotation of the shuttle box, the stops being located at such distances from the shuttle box as to permit the shuttle when in the shuttle box to pass by them, a two-arm frictional damper permanently mounted upon the free end of the control lever, one arm of the damper bing provided with a surface for receiving and adjusting the position longitudinally of the shuttle receiving guideway a gripper shuttle which has arrived in shuttle box, a mechanism for stopping the loom upon the incorrect arrival of a shuttle in the shuttle box, the other arm of the damper forming a feeler for said loom stopping mechanism.

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**3,895,658**

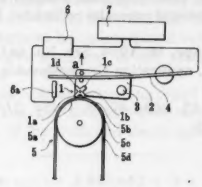
## PAPER CARD READING APPARATUS IN A DOBBY MACHINE

**Akira Koyama, Nagoya, Japan, assignor to Yamada Dobby Co., Ltd., Japan**

**Filed Jan. 2, 1974, Ser. No. 430,037**
**Claims priority, application Japan, Dec. 29, 1972, 48-2485**
**Int. Cl.²** **D03C** *1/22, 15/04*
**U.S. Cl. 139—331** **6 Claims**

1. A reading apparatus in a loom Dobby for reading weaving instructions to be transmitted to a loom comprising, means for continuously driving an instruction record thereon in operation, said instruction record having thereon holes representative of and corresponding to weaving instructions to be transmitted to a loom, a toothed reading wheel having peripheral teeth insertable into said holes for reading of said instruction record, a reading lever pivotally mounting said reading wheel and elastically biased for engaging the teeth of said reading wheel with the driven instruction record for frictional drive of

said reading wheel therefrom and insertion of said teeth into said holes when correspondence of a tooth and a hole occurs and retraction of the teeth of said wheel from said holes occurs as said instruction record is rotationally driven, and instruction transmitting means including said reading lever for transmitting the reading of said holes of said instruction record.



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**3,895,659**

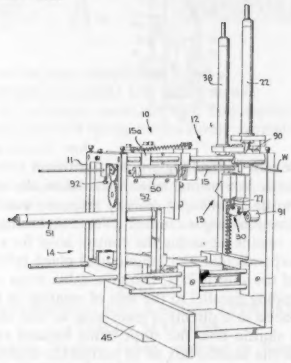
**WIRE HANDLING AND MANIPULATING APPARATUS**

John F. Fidiam, 13133 Madonna Lane, Fairfax, Va. 22030

Filed May 30, 1973, Ser. No. 365,284

Int. Cl. B21f *15/00*

U.S. Cl. 140—93R 47 Claims



1. A wire wrapping apparatus for interconnecting electrical terminals comprising a rotary wire wrapping tool, means for feeding wire of an indeterminate length to said tool, means for catching and loading said wire on said tool including gripper means separate from but adjacent said tool stripping and cutting means for forming the first and second connector ends of said wire to be wrapped on the terminals, said gripper means positively holding said wire at least during stripping, means for relatively advancing and retracting at least said tool with respect to said terminal, said advancement being along the Z axis of the tool and toward said terminal, means for rotating said tool to perform the wrapping operation, and locator means for relatively traversing said tool with respect to said terminals to a new X, Y location, whereby a single tool with minimal frontal area is operative to position and wrap both ends at the proper Z level on said terminals to form a complete wired interconnection.

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**3,895,660**

**HANDLING OF THIN WALLED CONTAINERS**

John A. French, and John C. Turner, both of St. Albans, England, assignors to Schweppes Limited, St. Albans, England

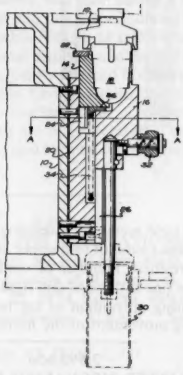
Filed Nov. 1, 1972, Ser. No. 302,961

Claims priority, application United Kingdom, Nov. 5, 1971, 51446/71; Nov. 5, 1971, 51447/71; Nov. 5, 1971, 51448/71

Int. Cl. B65b *43/60*

U.S. Cl. 141—172 11 Claims

1. Handling apparatus for handling thin walled containers including a handling unit comprising a plurality of individual container holders each adapted to hold a container in upright manner therein, means maintaining the holders in spaced relationship and defining an endless path, means for moving the holders in said endless path, each of said of being split vertically to define two parts which are relatively displaceable vertically from a holder closed position to a holder open position in which one of said holder parts becomes an upper holder part and the other of said parts becomes a lower holder part so that a container can be moved horizontally into the upper holder part by a container moving means, and means for relatively displacing vertically the holder parts of each holder from the holder closed position to the holder open position and for returning the parts to the holder closed position.



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**3,895,661**

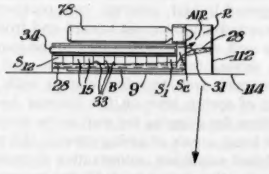
**CUVETTE APPARATUS FOR TESTING A NUMBER OF REACTANTS**

Julius Praglin, East Lyme; James E. McKie, Jr., Ledyard; Alan C. Curtiss, Old Lyme, and David K. Longhenry, East Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 281,946, Aug. 18, 1972, Pat. No. 3,832,532. This application July 12, 1973, Ser. No. 378,594

Int. Cl. B65b *3/06*

U.S. Cl. 141—241 19 Claims



1. A compartmented container for dividing and testing the reaction of a number of reactants upon a solution comprising a longitudinal array of compartments having a longitudinal axis, each of said compartments having a filling and a testing lobe, partitions between each of said compartments said filling and testing lobes in each of said compartments being substantially aligned with each other, a testing lobe rest disposed parellel to said longitudinal axis and for holding said array with said testing lobes disposed in a testing lower position below said filling lobes to cause said solution to flow into said testing lobes from said filling lobes and be there held, a filling lobe rest disposed parallel to said longitudinal axis and for

holding said filling lobes in a filling lower position below said testing lobes to cause said solution to be distributed within said filling lobes, a reservoir contiguous to said filling lobes for providing said solution to said filling lobes, connecting ports in said partitions between said reservoir and each of said filling lobes to allow quantities of said solution to become equally distributed between said filling lobes from said reservoir when said filling lobes are disposed in said filling lower position, said filling lobes in said filling lower position each having a volume which contains quantities of said solution which are smaller than the volume of each of said testing lobes in said lower position, said filling testing lobes being connected to one each of said testing lobes whereby rolling said container about its axis with said filling lobes in the filling lower position to the position in which said testing lobes are in the testing lower position pours said equally distributed quantities of solution into said testing lobes, and apertures in a wall of each of said compartments above said testing lobes for inserting said reactants into said testing lobes.

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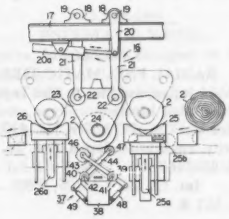
**3,895,662**

## APPARATUS FOR PRESHAPING RAW LOGS

**Nagaoka Noriyuki, Nagoya, and Niimi Haruo, Handa, both of Japan, assignors to Kabushiki Kaisha Taihei Seisakusho, Japan**

**Division of Ser. No. 271,201, July 12, 1972, Pat. No. 3,842,874. This application May 20, 1974, Ser. No. 471,712**
**Claims priority, application Japan, July 13, 1971, 46-51480; July 15, 1971, 46-52549**
**Int. Cl. B27l** *5/02*
**U.S. Cl. 144—209 A** **3 Claims**



1. Apparatus for preshaping a raw log for economical rotary cutting thereof comprising: a centering device for intercepting said log fed thereto and carrying out centering to determine at least one center axis thereof; a log handling device for grasping, carrying, and rotating the log thus centered; a detecting device for detecting that point in each of the intersections between the outer surface of the log and a plurality of longitudinal sections passing through the center axis of the log which is nearest the center axis; and a shaping device for cutting away the outer surface part of the log along element lines each alined in parallel to the center axis and passing through a respective one of said detected points, while carrying out profiling based on the detected points, thereby to preshape the log into a columnar shape of substantially the same planar shape in any cross section thereof.

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**3,895,663**

## LOCKING DEVICE FOR THREADED FASTENERS

**John D. Bashline; Charles A. Dravis, both of Flushing, Ohio, and Richard D. Frye, Erie, Mich., assignors to Donald R. Hunsche, Cincinnati, Ohio**

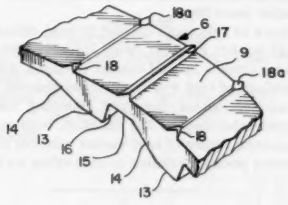
**Filed Mar. 15, 1973, Ser. No. 341,398**
**Int. Cl.[2] F16B** *39/28*
**U.S. Cl. 151—34** **3 Claims**

1. In a locking device for use with a threaded fastener, such as a fastener of the bolt-and-nut type, the combination of

two locking members,

one of said locking members being an annular washer member having a toothed face and a cam face, and the other of said locking members having a cam face which is substantially identical to and capable of mating with said cam face of said washer member,

the toothed face of said washer member being in the form of a flat annular surface interrupted by a plurality of teeth which are spaced apart throughout the length of said surface and which provide points of support which are distributed over both the annular length and the radial width of said annular surface and which support the washer member against forces directed axially of the fastener as the fastener is tightened;



said cam face of said washer member comprising a closed circular series of groups of surfaces each including, in order of sequence, a substantially flat crown surface, a slow taper cam surface, a substantially flat low surface, and a fast taper cam surface, said fast taper cam surface of each group being inclined oppositely with respect to said slow taper cam surface of that group and joining said crown surface of the next successive group,

said low surfaces lying in a first common plane parallel to said flat annular surface of said toothed face, said crown surfaces lying in a second common plane parallel to said flat annular surface, and said first common plane being substantially nearer said flat annular surface than is said second common plane, whereby said low surfaces are located on relatively thinner portions of the washer member and said crown

surfaces are located on relatively thicker portions of the washer member, the surfaces of said groups of surfaces on said washer member being so oriented that, when the washer member is disposed with its cam face directed toward the nut of a bolt-and-nut type fastener, and the order of said cam surfaces is considered in the direction of tightening rotation of the nut, said crown surface will be first and said fast taper cam surface last in each group,

said cam faces being complementary so that, when said washer member and said other locking member are placed together cam face-to-cam face, said crown surfaces of said washer member can be mated respectively with said low surfaces of said other locking member and said fast taper cam surfaces of said washer member will respectively engage said fast taper cam surfaces of said other locking member,

said slow taper cam surfaces being inclined at an angle which is greater than the thread rise of the fastener, and said fast taper cam surfaces being inclined away from the plane of the locking member at an angle of 93°–135°;

said teeth of said toothed face including a first plurality of teeth each in the form of a raised edge of generally triangular transverse cross section, and a second plurality of teeth,

said first plurality of teeth being spaced apart circumferentially of the washer member and each extending generally radially thereacross, each tooth of said first plurality of teeth being located on a different one of said thinner portions of the washer member,

the teeth of said second plurality of teeth being mutually independent and located on said thicker portions of the washer member,

the teeth of said first and second plurality of teeth all being of substantially the same height and said height being equal to a substantial fraction of the thickness of said thinner portions of the washer member;

tightening of the fastener when said washer member and said other locking member are mated cam face-to-cam face and initially clamped by the fastener causing said fast taper cam surfaces of one of said members to coact with said first taper cam surfaces of the other of said members, such coaction of said fast taper cam surfaces forcing said washer member and said other locking member axially apart and thereby causing said teeth of said washer member to be inserted into the member adjacent thereto in the fastener assembly,

the ones of said teeth carried by said thicker portions of said washer member being inserted more deeply than those carried by said thinner portions, and said thinner portions of said washer member thereby being slightly distorted, under the axial clamping forces resulting from tightening of the fastener, with such distortion opposing return of said washer member toward its fully mated position relative to said other locking member.

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**3,895,664**

## VEHICLE ANTI-SKID DEVICE

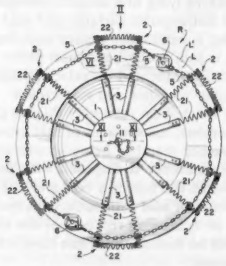
**Fritz Muller, Gruneggstr. 38b, 6000 Lucerne, Switzerland**

**Filed Jan. 28, 1974, Ser. No. 437,497**

**Claims priority, application Switzerland, Feb. 23, 1973, 2624/73**

**Int. Cl. B60c** *27/02*

**U.S. Cl. 152—225** **10 Claims**



**1.** An anti-skid device for the wheels of vehicles, comprising a support which can be attached to a part of the vehicle defined by either the wheel, the hub or the axle of the vehicle, a plurality of spring straps, each of said straps having a pair of spring arms and a pair of ends attached with said support, said plurality of spring straps extending outwardly from said support to provide a substantially star-like configuration of said straps at said support, each of said straps having a portion which is flexed only over the tread of the tire, means for pivotably connecting each pair of the spring arms with the support, said pivotably connecting means comprising a respective pivot shaft for each spring strap, each pivot shaft extending transversely with respect to the axis of the wheel, a lengthwise adjustable tensioning chain serving as a lateral connection of the spring arms, at least one tensioning lock means for the lengthwise adjustment of the tensioning chain, wherein in the mounted condition of the anti-skid device the spring straps arranged between the wheel and the support are pressed against the wheel and against the support by tensioning the tensioning chain.

**3,895,665**

## REINFORCEMENT FOR RUBBER TIRES

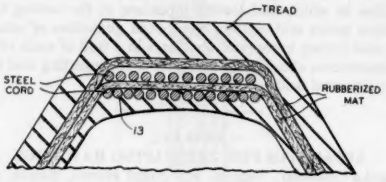
**Wilhelm Heling, Bensheim-Auerbach, and Rudolf Ammann, Weinheim, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany**

**Filed Dec. 21, 1972, Ser. No. 317,337**

**Claims priority, application Germany, Dec. 24, 1971, 2164667**

**Int. Cl. B60c** *9/16, 9/18*

**U.S. Cl. 152—357** **8 Claims**




**1.** A tire comprising a thread and a carcass portion, said carcass portion reinforced by a non-woven mat, said mat comprising randomly disposed linearly deformed metal fibers entangled with one another in the form of a cohesive mass, said metal fibers being in the form of staple fibers having a staple length up to 100 mm. and a thickness of 0.05 to 0.3 mm, said mat having pores between said metal fibers through the thickness of said mat, said pores containing rubber.

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**3,895,666**

## RADIAL PNEUMATIC TIRE

**Teruo Inoue, Yao, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan**

**Filed Dec. 26, 1973, Ser. No. 427,615**

**Claims priority, application Japan, Dec. 26, 1972, 48-2466; Dec. 26, 1972, 48-2467**

**Int. Cl. B60c** *15/06, 9/02*

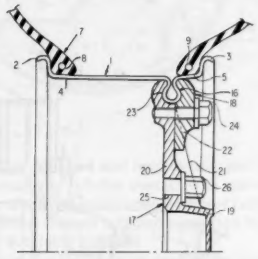
**U.S. Cl. 152—362 R** **9 Claims**

**1.** In a pneumatic tire of the radial type having at least one ply of carcass cords extending from annular beads at both ends radially inward of the tire in a nearly radial direction, the improvement wherein: said carcass cords comprise an organic fiber, and wherein a reinforcing ply of steel cords is disposed in the bead area and a lower sidewall area adjacent said bead area and radially outwardly of said carcass cord plies, a terminal edge of said reinforcing ply being embedded with and wrapped by a covering ply of a textile fabric coated with an elastomeric compound, and wherein said reinforcing ply is disposed at an angle ranging from 45° to 75° with respect to the radial direction of said tire and said covering ply is disposed at an angle ranging from 30° to 70° to the radial direction.

## 3,895,667
## PNEUMATIC TIRE AND WHEEL RIM ASSEMBLY

William E. Mitchell, Coventry, England, assignor to Dunlop Holdings Limited, England

Division of Ser. No. 125,513, March 18, 1971, Pat. No. 3,708,847. This application Oct. 6, 1972, Ser. No. 295,542
Int. Cl. B60b *21/02, 21/06, 23/08*
U.S. Cl. 152—378 R 13 Claims

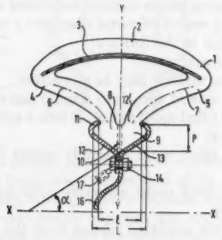


1. A pneumatic tire and wheel rim assembly comprising a sheet metal wheel rim having circumferentially extending said flanges and a base portion therebetween, the base portion having a circumferentially extending channel portion projecting radially inwardly therefrom said channel being loop shaped with the edges of the loop spaced slightly apart of the juncture of the loop with the base.

## 3,895,668
## PNEUMATIC WHEEL

Giorgio Tangorra, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

Filed Dec. 3, 1973, Ser. No. 421,059
Claims priority, application Italy, Dec. 20, 1972, 33204/72; Netherlands, Sept. 26, 1973, 13262; Yugoslavia, Oct. 1, 1973, 2574/73
Int. Cl. B60c *15/02, 17/00, 5/00*
U.S. Cl. 152—379 14 Claims

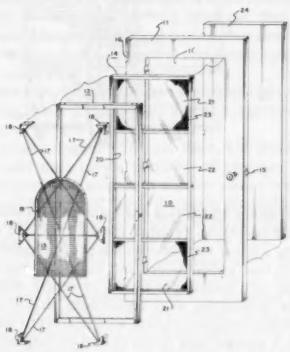


1. A pneumatic wheel for motor vehicles comprising:
a pneumatic tire with a tread, an annular reinforcing structure, two sidewalls having a convexity in the meridian plane of their section midline directed toward the inside of the tire and so constructed that as a result of the inflation air they are subjected to compression and to bending and
a rim connection zone being radially inner with respect to said sidewalls, said rim having a single seat for encasing said connection zone, said seat having the shape of a circumferential channel with an opening directed in a radially outer direction with respect to the axis of rotation of the pneumatic wheel, the width of said opening being smaller than the maximum width of said channel,
said connection zone having a cross-sectional profile of a form equal to that of the profile of said channel, the profile of said connection zone being enclosed by the profile of said channel, and the cross section of said connection zone being no smaller than the cross section of said channel; the cross section of said tire having a shape approximately that of an isosceles triangle whose base is represented by the chord subtending the annular reinforcing structure, the sides being represented by the chords subtending the respective section midlines of the sidewalls which are wholly internal to the sides of said triangle, the vertex comprised between said sides lying on the tire midline in said connection zone between the tire and the rim.

## 3,895,669
## SECURITY DOOR

G. Geert G. Heeling, 1350 Addison Ave., East Twin Falls, Idaho 83301

Filed Apr. 30, 1973, Ser. No. 355,637
Int. Cl.[2] E06B *7/28, 9/01*
U.S. Cl. 160—92 5 Claims



1. A security door, comprising:
a frame having a central cavity;
a hingedly mounted panel being mounted in said cavity;
a window-panel assembly mounted in said cavity by means of a sash and including a plurality of suitably mullioned lights;
a grill frame mounted over said window-panel assembly sash adjacent the perimeter of said cavity, said grill frame including a lip;
a grill including a lattice of rods disposed rectilinearly, transversely and diagonally across said cavity over said window-panel assembly; and
a plurality of gussets joining the intersects of said rods which occur about the geometrical perimeter of said lattice, said gussets being provided with means for fastening said lattice on said grill frame.

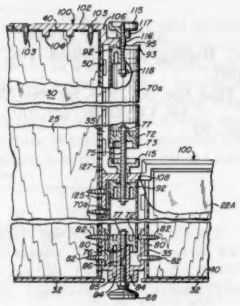
## 3,895,670
## SPACE DIVIDER

Emmett R. Bales, and Clarence F. Estes, Jr., both of North Manchester, Ind., assignors to Laminite Plastics Mfg. Corporation, Morristown, Tenn.

Continuation of Ser. No. 214,917, Jan. 3, 1972, abandoned. This application Sept. 10, 1973, Ser. No. 395,926
Int. Cl. A47g *5/00*
U.S. Cl. 160—135 2 Claims

1. A free-standing space divider in which a pair of panels are joined at a vertical post assembly and are adapted to be set at a plurality of predetermined angular relations with respect to each other so that the panels may be self-supporting without

the need of stabilizing feet or the like, comprising a first rectangular panel and a second rectangular panel, a vertical tubular center post between said panels, each of said panels having an upper hinge and a lower hinge attached at one vertical edge thereof, said post having an open upper end and an open lower end, an upper plug tightly fitted in and closing said post upper end and having an upper exposed radial surface, means on said surface defining a plurality of angularly arranged, radially-extending teeth-like projections, each of said upper hinges having transversely extending portions adapted to be positioned in overlying relation to said plug at the upper surface thereof, the lower surfaces of each of said upper hinges being formed with corresponding teeth-like projections which are



proportioned for interfitting engagement with selected ones of said plug projections, retainer means threaded on said plug and having a lower surface which is proportioned in overlying relation to said upper hinges and movable into clamping arrangement with said upper hinges to assure engagement between the interfitting said projections to define a desired predetermined angular relation with respect to said panels and said post, a second plug fitted in and closing said post lower end, means associated with said second plug defining an annular recess in underlying relation to said post, and each of said lower hinges having axially extending portions adapted to be received in said recess providing pivotal support of said panels at the lower ends thereof about said post.

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**3,895,671**

**METHOD OF MANUFACTURING A THIN SHEET OF BERYLLIUM OR AN ALLOY THEREOF**

**Kunio Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Nov. 13, 1973, Ser. No. 415,417**

**Claims priority, application Japan, Nov. 15, 1972, 47-114561**

**Int. Cl.[2] B22D** *23/00*

**U.S. Cl. 164—46** **13 Claims**

1. A method for manufacturing a thin sheet of metal selected from a group consisting of beryllium and beryllium alloy which comprises the steps of fabricating a substrate of a predetermined shape made of material selected from a group consisting of copper and magnesium, depositing the thin sheet of said metal on said substrate, and removing the thin sheet from the substrate by dissolving the latter in nitric acid.

9. A method for manufacturing a thin sheet of metal selected from the group consisting of beryllium and beryllium alloy which comprises the steps of fabricating a substrate of quartz glass into a prescribed form, depositing a thin sheet of the metal on the substrate, and heating the combination to separate the thin sheet from the substrate due to different thermal expansion coefficients between the metal and the quartz glass.

**3,895,672**

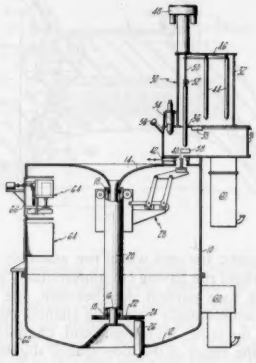
**INTEGRATED FURNACE METHOD AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF INDIVIDUAL CASTINGS**

**Robert E. King, Jr., West Willington, and Bruce E. Terkelsen, Cheshire, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.**

**Filed Dec. 26, 1973, Ser. No. 427,980**

**Int. Cl.[2] B22D** *15/00, 27/16*

**U.S. Cl. 164—60** **16 Claims**



9. The method of producing castings continuously in a furnace system having a controllable atmosphere including the steps of:

providing a controlled atmosphere in the furnace;

admitting a supply of casting plates into the furnace through an atmospheric interlock;

admitting a supply of molds into the furnace through an atmospheric interlock;

cooling the casting plates;

preheating the molds;

combining individual preheated molds with individual cooled casting plates to form individual mold assemblies;

admitting a source of metal alloy into a melting and pouring chamber in the furnace;

melting the metal alloy;

collecting the melted alloy in a crucible;

pouring the melted alloy into a mold assembly;

inserting the filled mold assembly into a solidification cell in the furnace;

soaking the filled mold assembly within the solidification cell;

cooling the filled mold assembly until the metal alloy is frozen; and

discharging the solidified casting from the furnace through an atmospheric interlock.

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**3,895,673**

**GAS COVER FOR CASTING MACHINE**

**Charles Christian Gerding; Egil Aukrust, and Robert L. Fazio, all of Pittsburgh, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.**

**Filed July 31, 1974, Ser. No. 493,288**

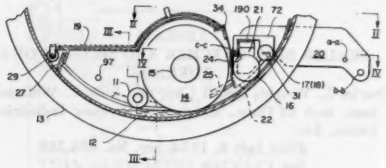
**Int. Cl.[2] B22D** *27/00, 11/06*

**U.S. Cl. 164—259** **16 Claims**

1. A gas cover assembly in combination with a strip casting device, said strip casting device including a rotatable concave lower casting member, a rotatable roll having a drive shaft for causing cast strip material to remain in contact with said rotatable concave lower casting member upon strip formation,

and feed means for feeding liquid material onto said rotatable concave lower casting member; said gas cover assembly comprising:

a. a gas cover compartment enclosure housing positioned over at least a portion of said feed means and located so as to be in substantially sealed relationship with said rotatable concave lower casting member, said drive shaft



of the rotatable roll, and said feed means, said gas cover enclosure housing in rollable contact with and supported by a portion of said rotatable concave lower casting member and in pivotal contact with and supported by the drive shaft of said rotatable roll; and

b. gas feed means for feeding a protective gas into said gas cover compartment.

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**3,895,674**

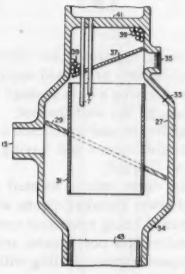
**INLET FLOW DISTRIBUTOR FOR A HEAT EXCHANGER**

**William G. Harris, Tampa, Fla., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.**

**Filed Feb. 24, 1972, Ser. No. 229,000**

**Int. Cl. F28f** *7/00*

**U.S. Cl. 165—134** **3 Claims**



1. A heat exchanger having a shell portion, a plurality of tubes disposed lengthwise within said shell, to form a tube bundle, said shell having a head portion adjacent one end thereof, a fluid inlet nozzle adjacent said one end, a portion of the shell containing said inlet nozzle having a greater diameter than the remainder of the shell and being eccentrically disposed with respect to the remainder of the sehll, the inlet nozzle being so disposed in the greater diameter portion to maximize the distance between the inlet nozzle and the tubes, and flow directing means disposed in the flow path between said nozzle and said tubes, said flow directing means comprises a plurality of flat plates disposed at an oblique angle with respect to the axis of the inlet nozzle and with respect to the axis of the tube bundle, the flat plates being so disposed as to generally diverge as the distance from the inlet nozzle increases, each of said plates being coopertively associated with a generally circular plate through which the tubes pass, each circular plate having a portion thereof cut away to direct fluid flowing from said inlet nozzle to a different portion of the tube bundle and lengthwise along the outside of the tubes, thereby minimizing the flow resistance of the fluid while so directing the flow.

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**3,895,675**

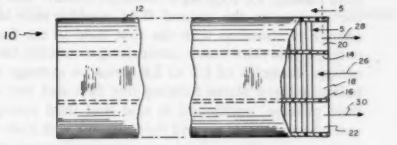
**BREATHING GAS HEAT EXCHANGER**

**Charles R. Rein, and Charles B. Jones, Jr., both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 15, 1973, Ser. No. 388,704**

**Int. Cl. F28f** *1/42;* **F28d** *1/09*

**U.S. Cl. 165—164** **4 Claims**



1. An intermittent flow heat exchanger for use in a breathing system wherein gas to be breathed is to be heated to higher temperatures by exchange of heat from gas that has been breathed, and wherein said gases are each moved intermittently so as to have flow periods and non-flowing periods, said exchanger comprising:

an elongated duct having walls formed of rigid, thermally insulating material, said duct having a substantially uniform cross section from end-to-end;

septum means, disposed in said duct, for dividing space within said duct into a plurality of passages extending lengthwise of said duct, said septum means comprising a thin panel formed of rigid, thermally insulating material free of relatively heat conductive material lying in a plane extending parallel to said directions of flow;

a plurality of elongated, thermally conductive metal wires extending through said septum means at right angles thereto, and transversely across said passages said metal wires being received in pre-formed holes extending through said panel, and effectively obturating said holes; said panel together with the portions of said metal wires that are covered thereby being characterized as having low thermal capacity whereby thermal energy applied to said metal wires in a first passage during one of said flow periods for said gas that has been breathed is conducted, substantially without capacitive delay, to said gas to be breathed in a second of said passages.

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**3,895,676**

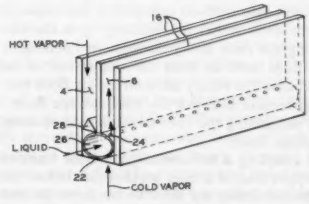
**HEAT EXCHANGER DISTRIBUTOR**

**Richard K. Young, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Continuation-in-part of Ser. No. 209,071, Dec. 17, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 415,136**

**Int. Cl. F28f** *3/14*

**U.S. Cl. 165—167** **7 Claims**




1. A heat exchanger-distributor, comprising:

at least first, second and third spaced-apart plates forming at least first and second passages extending in a common substantially vertical direction;

first means adjacent a first end of said passages for passing a first fluid through the first passage in a first direction; second means adjacent a second end of said passages for passing a second fluid through the second passage in a second direction, said second direction being opposed to said first direction; and

third means, adjacent said second end of said passages and disposed between said first and second means, for passing a third fluid through the second fluid passage and distributing said third fluid into the second fluid in the second fluid passage for forming a resultant mixture and passing the mixture in the second fluid passage into heat exchange relationship with the first fluid in the first fluid passage, said third means comprising a conduit, having an outside diameter of **1.1** to **2.0** times an average spacing between three plates forming one first and one second fluid passage, positioned in said first fluid passage and extending into said second fluid passage with said conduit having a plurality of fluid exit openings formed along its length and opening into said second fluid passage.

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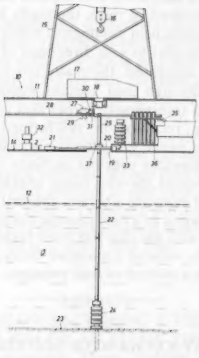
**3,895,677**

## RISER PIPE STACKING METHOD

**Donald G. Bokenkamp, Houston, Tex., assignor to Dolphin International, Inc., Houston, Tex.**

**Filed Jan. 18, 1974, Ser. No. 434,651**
**Int. Cl.[2] E21B** *19/14, 19/16, 7/12*
**U.S. Cl. 166—.5** **4 Claims**



**1.** In an offshore drilling system on location in a body of water, a method for manipulating riser pipe sections between a stored condition of individual sections in a storage area in a drilling rig and an operational condition of sections coupled to one another to define a riser string where said riser string extends downwardly from the drilling rig toward the floor under the water, said method comprising the steps of

coupling the draw works of a drilling rig to the riser string and lifting the riser string through an opening in a riser storage floor until at least the upper end of said riser string is below the rotary table on the rig floor and at least one riser section is above the riser storage floor,

releasably supporting the riser string at said opening in said riser storage floor,

releasably coupling a horizontally movable transfer means to the upper end of a riser section just below the rotary table, disconnecting the draw works from the riser string and disconnecting such riser pipe section from the riser string at a location above said opening,

raising such uncoupled riser pipe section on the horizontal transfer means to clear the end of the supported riser string and transferring such uncoupled riser pipe section in a horizontal direction while in a vertical condition to a storage area on the same level,

at such storage area, lowering such uncoupled riser pipe section with respect to the horizontal transfer means into a storage position on a pipe rack, and

securing such uncoupled riser pipe section to said pipe rack.

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**3,895,678**

## SEALER BALL CATCHER AND METHOD OF USE THEREOF

**Charles L. Wright, Ratliff City, and Billy C. Williams, Graham, both of Okla., assignors to Dresser Industries, Inc., Dallas, Tex.**

**Filed July 8, 1974, Ser. No. 486,288**
**Int. Cl.[2] E21B** *33/124, 43/26, 43/27*
**U.S. Cl. 166—284** **11 Claims**

**1.** Oil well servicing apparatus for diverting perforation sealer balls into a collection area, said apparatus comprising:

upper mandrel means having a bore passage therethrough and flow port means through the wall thereof;

lower tubular mandrel means connected to the lower end of said upper mandrel means and having flow port means through the wall thereof;

perforated tubular liner means located concentrically in said upper and lower mandrel means with the upper end of said liner means being open and communicating with said upper mandrel flow port means, and the perforations in said liner means communicating with said lower mandrel port means; and,

annular seal means on said apparatus, located below said upper port means, and adapted to provide an annular seal between said apparatus and the oil well casing in which it is located, said seal means further adapted to channel sealer balls into said upper port means.

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**3,895,679**

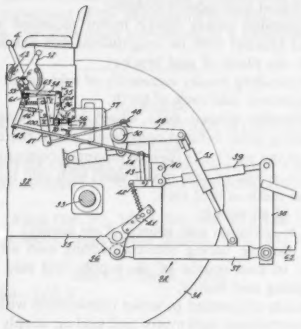
## FRICTION BLOCK FOR LEVER

**Robert C. Haupt, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Division of Ser. No. 320,293, Jan. 2, 1973, Pat. No. 3,789,694.**
**This application Oct. 26, 1973, Ser. No. 410,186**
**Int. Cl. A01b** *63/112*
**U.S. Cl. 172—9** **10 Claims**

**1.** A draft control system on a draft vehicle for controlling the height of an implement comprising, a draft vehicle, a draft control system on said draft vehicle including, a pivotal lever on said vehicle for positioning the height of the implement, support means on said vehicle pivotally supporting said lever and defining a pivotal axis, a friction control on said pivotal

lever providing a friction lock in a first direction and a friction lock release in the second direction including, a friction block radially spaced from said axis and pivotally mounted on said support means, friction means on said friction block engaging



said lever, resilient means on said support means and connected to said friction block biasing said friction means to an engaging position to retard movement of said lever in one direction and permit release of said friction means on said lever to permit said lever to pivot freely in the other direction.

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**3,895,680**

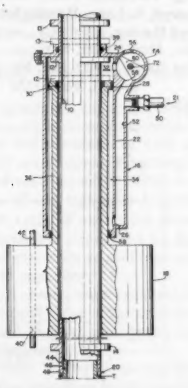
## FLUID ACTUATED HAMMER

**Allen B. Cook, 2121 W. 38th Ave., Vancouver, B. C., Canada**

**Continuation-in-part of Ser. No. 212,957, Dec. 28, 1971, abandoned. This application Apr. 19, 1973, Ser. No. 352,556**

**Int. Cl. H01b** *5/00*

**U.S. Cl. 173—78** **13 Claims**



**1.** Apparatus for driving a casing and permitting the casing to be cleaned out while being driven, comprising a hollow central member having a straight, large axial opening adapted for receiving rods or the like, a driving mechanism surrounding said central member, said driving mechanism including a cylinder axially slidably mounted on said central member and a piston surrounding said central member, means on said central member for limiting said sliding movement of said cylinder, a piston rod secured at one end to said piston, and a ram secured to the opposite end of the piston rod, means at the lower end of the central member for aligning said central member with the casing to be driven and adapted to be impacted by said ram axially of said central member for downward movement, thus forcing the casing downwardly, and air supply means for delivering air to said cylinder in a prearranged sequence to propel the ram downwardly to drive the casing into the ground.

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**3,895,681**

## LOAD INDICATING ASSEMBLY

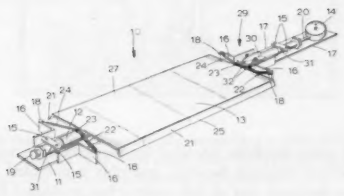
**Colin John Griffin, and Kerry Charles Griffin, both of 158 Pinnacle Dr., Upper Ross, Townsville, Australia (4810)**

**Filed Nov. 4, 1973, Ser. No. 415,500**

**Claims priority, application Australia, Mar. 16, 1972, 53405/73**

**Int. Cl. G01g** *19/10*

**U.S. Cl. 177—141** **4 Claims**

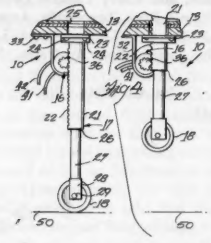


**1.** A load indicating assembly usable for weighing vehicles and the like and comprising, a support base supporting a resiliently deformable member, a load platen arranged to engage said resiliently deformable member in such manner that a load placed on said load platen will cause deformation of said resiliently deformable member, and indicating means sensitive to such deformation and calibrated to indicate the weight of said load, said resiliently deformable member being a sealed fluid filled resilient tube, said indicating means comprising a pressure gauge connected operatively to said resilient tube to indicate the pressure of the fluid therein, said load platen comprising a substantially flat, horizontally inclined rectangular plate, the latter being supported on said sealed fluid filled resilient tube, said rectangular load platen being elongate and of such length that it is adapted to support thereon a set of dual wheels of a truck axle assembly, with the axis of said wheels substantially parallel to the longitudinal edges of said load platen to enable said load indicating assembly to be used to indicate the weight of said dual wheels, said resilient tube extending along the underside of said load platen and beyond the ends thereof with its axis disposed centrally beneath the longitudinal center line of said load platen, said platen being tiltable about said tube to form, in operation, an approach ramp and an exit ramp to and from the central portion of said platen, said longitudinal edges of said elongate rectangular platen being turned downwards so that in operation, as a vehicle wheel is driven onto said load platen the latter tilts to form an approach ramp and the down-turned edge contacts the surface upon which the assembly is supported in such manner that the contact force between said wheel and said platen, due to the forward motion of said vehicle wheel is transmitted directly to said supporting surface through said downwardly-turned edge, by contact therebetween, and as said wheels move across the load platen, the latter rocks about said elongate tube until the said downturned edge is moved clear of the support base so that the load indicating assembly indicates only the true static weight of said vehicle wheel, said support base being a flat, elongate, rectangular metal plate and said fluid filled resilient tube extending centrally therealong, said assembly being of such size as to be portable, said fluid filled tube being clamped to said base adjacent the ends of said load platen, the latter being arranged to be maintained in its operative position supported on said fluid filled tube by a pair of chains connected between the ends of said platen and said base and a pair of springs opposing said chains to maintain tension therein.

## 3,895,682
## MOTOR DRIVEN DOLLY ACTUATOR FOR SEMI-TRAILERS AND SIMILAR VEHICLES

Richard G. Graham, 1618 Regent St., Niles, Mich. 49120

Filed Sept. 26, 1973, Ser. No. 400,969
Int. Cl. B60s 9/18
U.S. Cl. 180—1 R 1 Claim



1. A dolly assembly intended for use with a tractor-trailer type vehicle wherein the dolly assembly is provided for supporting the front end of the trailer when separated from the tractor, the dolly assembly comprising, in combination:

a ring shaped collar member mounted to the bottom surface of the trailer concentric with an opening provided through the trailer bottom surface which is of a diameter not less than the diameter of the opening in the ring shaped collar member;

an elongated vertically disposed cylindrically shaped supporting column having a top end, a bottom end, and vertically extending cylindrical side wall surfaces;

an elongated solid cylindrically shaped rod disposed concentric with said supporting column and having a top end, a bottom end, and cylindrical side wall surfaces;

said top end of said rod being affixed to said bottom end of said supporting column concentric therewith, said rod projecting vertically downwardly therefrom;

an inverted U-shaped bracket having a bight portion and opposed parallel leg portions, the bight portion being affixed to said bottom end of said rod and projecting diametrically outwardly of opposite diametric portions of said rod with said leg portion extending parallel to the longitudinal axis of said rod and downward from said bottom end thereof;

a pin member extending laterally between the opposite ends of said leg members and affixed thereto;

a dolly wheel of a width less than the distance between said leg members and of a diameter less than the distance from said pin member to said bight portion being provided, said dolly wheel having a bore extending through the axis thereof of a diameter greater then said pin with said dolly wheel being rotatively mounted on said pin for rotation thereabout, the dolly wheel being straddled within said leg members;

said top end of said support column being received in said collar member opening with said support column mounted for reciprocal vertical movement relative to said collar member for movement between a retracted position inwardly of said collar member and projecting into said trailer to raise the dolly wheel out of contact with the ground a sufficient distance to prevent any interference of the dolly wheel with the towing of the trailer when attached to the tractor, and to an operable extended position outwardly of said collar member where the dolly wheel is disposed in contact with the ground for supporting the front end of the trailer when separated from the tractor;

a rack of continuous teeth formed integrally along a a longitudinal segment of said support column side walls intermediate said top and said bottom ends thereof;

said rack disposed in the plane defined by said dolly wheel and said axis of said support column;

a U-shaped bracket affixed to the trailer bottom surface in a position adjacent said support column and extending in a plane parallel to said plane defined by said rack of teeth, dolly wheel and support column;

an air operated power driven motor mounted in said U-shaped bracket with its longitudinal axis extending normal to the plane of said bracket;

a shaft extending axially outwardly of said motor to a position adjacent said rack of teeth;

a cylindrically shaped gear wheel having longitudinally extending teeth defined completely about the circumference of the side walls thereof mounted concentric on the outermost end of said motor shaft with said teeth engaging the teeth of said rack;

a source of air supply;

a pump to maintain said source of air supply;

suitable flexible tubing interconnecting said air operated motor to said source of air supply and said pump for energizing said motor;

valve means connected in series relationship with said tubing intermediate said motor and said air supply and operable to direct air supply in a first direction for effecting the operation of said motor in a first direction to retract said column and raise said dolly wheel out of contact with the ground, and operable in a second position to energize said motor in a second direction to lower said column and effect engagement of said dolly wheel with the ground to support the trailer thereon;

said valve means being disposed in the tractor cab to effect operation of the motor and the dolly assembly from the vehicle operator's position in the tractor cab without the operator having to leave the cab.

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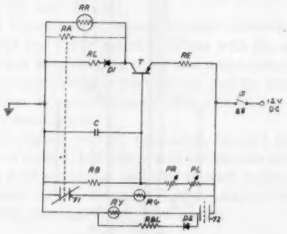
## 3,895,683
## LATERAL ACCELERATION SENSING SYSTEM

Thomas J. Lang, Torrance, Calif.; Kenneth G. Lang, East Northport; Joseph A. Lang, Huntington Station, and Robert L. Davis, Lloyd Harbor, all of N.Y., assignors to Lang Davis Industries, Inc., Huntington, N.Y.

Filed July 5, 1972, Ser. No. 269,035
Int. Cl. B60t 7/20
U.S. Cl. 180—103 5 Claims



1. An automatic stability control system for a vehicle to prevent swerving and swaying of said vehicle, said system comprising means for sensing lateral acceleration forces acting upon said vehicle to provide low level electrical acceleration signals representative of the magnitude of said forces, means for amplifying said low level acceleration signals to provide large amplitude brake control signals proportional to the magnitude of the forces, and brake means associated with said vehicle including right and left brakes and responsive to said brake control signals to simultaneously actuate said right and left brakes in equal, gradual and continuous mode to prevent swaying and swerving of said vehicle, said sensing means including a pair of pendulums oriented to sense only left and right acceleration, respectively, each of said pendu-

lums including adjustable stop means positioning the pendulum in a predetermined angular at rest position for varying the minimum lateral acceleration force necessary to effect movement of each pendulum, each of said pendulums being operatively associated with a potentiometer to provide low level electrical lateral acceleration signals proportional to the magnitude of movement of the pendulums such that instantaneous response is provided upon movement of a pendulum.

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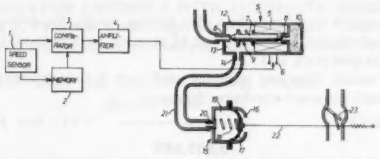
**3,895,684**

## ELECTRONIC SPEED CONTROL SYSTEM FOR VEHICLES

**Nakane Takeshi, Okazaki, and Sakakibara Naoji, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya Japan**

**Filed Oct. 31, 1973, Ser. No. 411,186**
**Claims priority, application Japan, Oct. 31, 1972, 47-109063**
**Int. Cl.² B60K *31/00***
**U.S. Cl. 180—105 E** **3 Claims**




1. An electronic control system for use in automatically controlling speed of a vehicle, comprising an actuator for a throttle valve of the vehicle;

means for generating a speed signal proportional to the vehicle speed;

a memory circuit including a capacitor, a high input impedance amplifier having a control electrode and an output terminal, one of the terminals of said capacitor being connected to said speed signal generating means and the other terminal of said capacitor being connected to the control electrode of said high input impedance amplifier; a manual control variable means for storing a reference signal in said capacitor connected to the junction between the control electrode of said high input impedance amplifier and said capacitor;

a comparison circuit connected to said memory circuit for operating said throttle valve actuator in accordance with the output of said high input impedance amplifier; in said comparison circuit including

a differential amplifier having connected first and second transistors, said first transistor being connected at its base to the output terminal of said high input impedance amplifier, said second transistor having a terminal forming the output of said differential amplifier and being connected at its base to a source of electrical energy, and means for controlling the output of said differential amplifier with respect to changes in said speed signal applied thereto after said reference signal is memorized in said memory circuit by actuation of said manual control means;

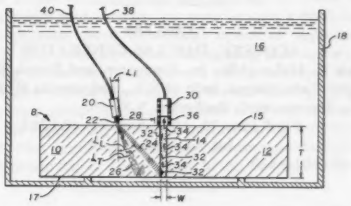
said means for controlling the output of said differential amplifier including a third transistor whose base is connected to the output of said means for generating a speed signal and whose collector is connected to the junction of the emitters of said first and second transistors.

**3,895,685**

## METHOD AND APPARATUS FOR ULTRASONIC INSPECTION OF WELDMENTS

**Carl L. Gillette, Chattanooga, and William M. Ramey, Hixson, both of Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Apr. 19, 1971, Ser. No. 134,999**
**Int. Cl. G01n *9/24***
**U.S. Cl. 181—.5** **25 Claims**




1. The method of ultrasonically inspecting a zone of interest extending a depth of at least about four inches into a material from a surface thereof comprising the steps of:

a. generating a beam of pulsed ultrasonic energy;

b. directing said beam at a location on said surface of said material in an incident direction and oblique angle thereto which result in the propagation in said material of a refracted beam of ultrasonic energy in the longitudinal wave mode which is incident with and intersects a portion of said zone of interest at an oblique angle to a line normal to said surface and passing through the intersected portion of the zone of interest, said incident ultrasonic energy being redirected upon contacting a discontinuity in said intersected portion of the zone of interest; and

c. detecting said redirected ultrasonic energy wich exits from said material substantially normal to said surface and within an area overlying said portion of the zone of interest intersected by said longitudinal wave beam, said detected ultrasonic energy being indicative of the presence of a discontinuity in said portion of the zone of interest intersected by said longitudinal wave beam.

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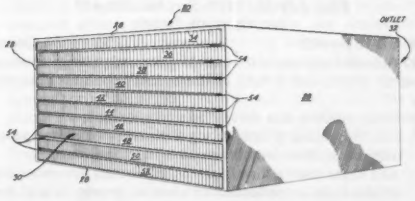
**3,895,686**

## ACOUSTIC ATTENUATOR PROVIDING RELATIVELY HIGH INSERTION LOSS AT LOW FREQUENCIES

**Sudhir D. Savkar; Walter B. Giles, and Robert B. Tatge, all of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Continuation of Ser. No. 308,323, Nov. 21, 1972. This application Mar. 4, 1974, Ser. No. 447,953**
**Int. Cl.² F01N *1/08***
**U.S. Cl. 181—56** **25 Claims**




1. Apparatus for attenuating the acoustic energy content of acoustic pressure waves propagating through a flowing fluid comprising: a conduit having inlet and outlet openings adapted for the entrance and exit, respectively, of the flowing fluid; and, at least one series of substantially rigid, acoustically

nonabsorptive plates mounted within said conduit and extending from said inlet opening toward said outlet opening, each plate in said series having a leading edge which is initially contactable by the flowing fluid and a trailing edge from which the flowing fluid can leave the plate, each plate in said series having at least one relatively flat surface extending from the leading edge to the trailing edge of the plate in a direction substantially parallel to the flow of said fluid, said plates in said series being spaced apart so that a space exists between the trailing edge of one plate and the leading edge of the next succeeding plate in the series.

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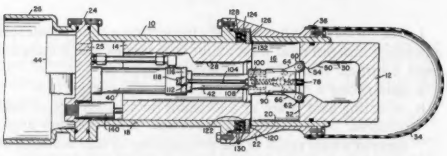
**3,895,687**

## ACOUSTIC IMPULSE GENERATOR

**Joseph K. McLaughlin, Jr., Rochester, and Dennis R. Courtright, Canandaigua, both of N.Y., assignors to Hydroacoustics, Incorporated, Rochester, N.Y.**

**Filed June 26, 1974, Ser. No. 483,262**
**Int. Cl.[2] G01V** *1/04*
**U.S. Cl. 181—120** **14 Claims**



**1.** For use in an acoustic impulse generator adapted to be submerged in which a piston is mounted for reciprocation in a housing in which the pressure is adapted to be lower than the pressure of the medium in which it is submerged, a mechanism for moving said piston against said pressure of said medium and then releasing said piston to generate said acoustic impulse which comprises

driving means in said housing movable toward and away from said piston for moving said piston to execute a forward stroke against the pressure of said medium,

roller means pivotally mounted on said driving means for engaging said piston,

said piston having a surface disposed for engagement with said roller means during said forward stroke, and

release means operative when said driving means moves a predetermined distance along its forward stroke for pivoting said rollerss so that they move off said piston surface and release said piston to execute a return stroke under the pressure of said medium whereby to generate the acoustic impulse.

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**3,895,688**

## ACOUSTIC TRANSMITTER

**John V. Bouyoucos, Rochester, N.Y., assignor to Hyroacoustics Inc., Rochester, N.Y.**

**Filed July 31, 1972, Ser. No. 276,457**
**Int. Cl. G10k** *10/00*
**U.S. Cl. 181—402** **34 Claims**

**1.** Acoustic apparatus for coupling acoustic energy from an acoustic source into a fluid medium, said apparatus comprising

a. a transmission line driven by said source,

b. said transmission line having a plurality of ports spaced from each other lengthwise along said line,

c. said transmission line also having means for providing substantially no reflection of acoustic energy in said line at each of said ports, and

d. means disposed adajcent each of said ports for establishing an anti-resonant condition thereat.

**34.** Acoustic Apparatus for coupling acoustic energy from an acoustic source into a fluid medium, said apparatus comprising

a. a transmission line driven by said source,

b. said transmission line having a port spaced from said source lengthwise along said line,

c. said transmission line also having means for providing substantially no reflection of acoustic energy in said line at said port, and

d. means disposed adjacent said port for establishing an anti-resonant condition thereat.

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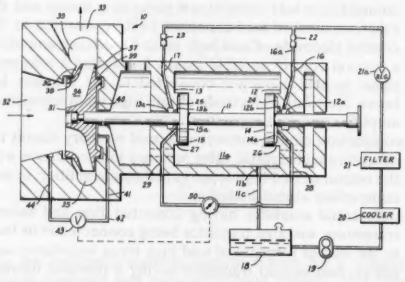
**3,895,689**

## THRUST BEARING LUBRICANT MEASUREMENT AND BALANCE

**Judson S. Swearingen, 500 Bel Air Rd., Los Angeles, Calif. 90024**

**Continuation-in-part of Ser. No. 1,130, Jan. 7, 1970, abandoned, and a continuation-in-part of Ser. No. 210,705, Dec. 22, 1971, Pat. No. 3,828,610. This application Sept. 7, 1973, Ser. No. 395,246**
**Int. Cl. F01m** *1/18*
**U.S. Cl. 184—6.4** **13 Claims**




**1.** The method of controlling the axial thrust on a thrust bearing assembly of a rotating machine wherein said thrust bearing assembly comprises a rotating component and a non-rotating component, one face of said rotating component and one face of said non-rotating component being in opposing relationship with each other, wherein a lubricant is forced in operation between the opposed faces of said components forming a first zone of pressure between said faces maintaining them separated and transmitting thrust load between them; and wherein there is a balancing means operable to apply a desired end thrust to one of said components to adjust

the thrust forces on said bearing; said method comprising the steps of determining from time to time the axial thrust on said assembly by monitoring the pressure of said lubricant in said first zone and operating said balancing means in accordance with the axial thrust determination to produce a desired aggregate thrust on said bearing assembly.

2. In a rotating machine having a thrust bearing assembly, said bearing assembly having a rotating component and a non-rotating component, one face of said non-rotating component and one face of said rotating component being in opposing relationship with each other, wherein a lubricant is forced in operation between the opposed faces of said components forming a first zone of pressure which is between said faces, and is pressurized to a thrust sustaining pressure to maintain said components separated, and a second pressure zone is created in said lubricant differing from said thrust sustaining pressure by an amount indicative of the thrust on said bearing assembly; the improvement which comprises a pressure determining means including a pressure sensing means exposed to said first zone, a pressure sensing means exposed to said second zone, and means for comparing the two, and a balancing means operable to adjust to a desired value, as indicated by said pressure determining means, the aggregate thrust force on said bearing assembly.

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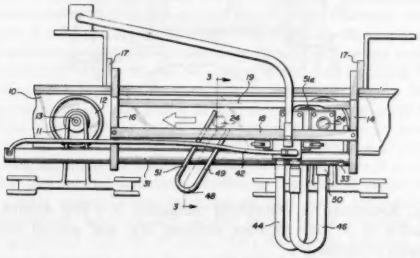
**3,895,690**

## LUBRICATOR ASSEMBLY WITH AUTOMATIC RESET

**Ronald E. Thomson, Cambridge, and Philip J. Kast, Madison, both of Wis., assignors to Madison-Kipp Corporation, Madison, Wis.**

**Filed Mar. 12, 1974, Ser. No. 450,330**
**Int. Cl. F16n *13/16***
**U.S. Cl. 184—15 A** **5 Claims**



1. In an automatic lubricator assembly for lubricating conveyor trolley wheels:

elongated guide means for guiding and supporting a movable carriage along a path to permit reciprocating movement thereof;

a carriage rotatably mounted on and movable along the length of said guide means from a starting position to a final position;

conveyor engaging means mounted on said carriage for engaging a moving conveyor and for permitting said carriage to be engaged and moved by and with said conveyor from said starting position along said guide means to said final position;

lubricating means on said carriage for lubricating a trolley wheel of said conveyor during the combined movement of said carriage and said conveyor;

return means for moving said carriage in a return direction to said starting position;

first control means actuated by movement of said carriage beyond a predetermined position for activating said return means, thereby returning said carriage to its starting position;

second control means for deactivating said return means when the starting position of said carriage is reached;

roller means mounted on said carriage for rollably supporting a portion of the weight of said carriage;

elongated roller support means arranged parallel to said guide means below and in supporting contact with said roller means, thereby preventing rotation of said carriage about said guide means during normal operation of said lubricator assembly, said roller support means including release means for permitting said carriage to rotate by gravity, when said carriage has gone beyond a predetermined position, from its normal operative supported position to a rotated position disengaging said conveyor engaging means from engagement with a conveyor; and reset means including an inclined surface leading downwardly from said roller support means to a position therebelow for supporting said roller means during the return of said roller means to its normal operative position during the return trip of said carriage to the starting position.

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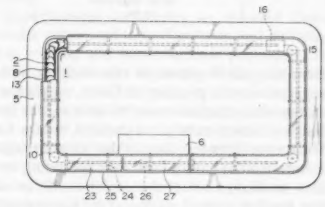
**3,895,691**

## CIRCULATIVE CATERING TABLE

**Yoshiaki Shiraishi, No. 68, Chodo 1-chome, Higashi-Osaka, Osaka-fu, Japan**

**Filed Jan. 14, 1974, Ser. No. 433,043**
**Claims priority, application Japan, Dec. 10, 1973, 48-140114**
**Int. Cl. E04h *3/04***
**U.S. Cl. 186—1 R** **5 Claims**



1. A circulative catering table comprising:

a base frame structure having inner and outer side walls defining therebetween an endless circulating path of travel; a fixed fringe table mounted substantially horizontally around the circumference of said outer side wall of said base frame structure; an endless conveyer mounted in said endless circulating path of travel for circulatively transferring meals on a surface thereof, said endless conveyer comprising a strand of chain movable in and along said endless circulating path of travel and meshed with and driven by a horizontally disposed sprocket wheel which is supported on a vertical shaft, and a series of crescent plates pivotally supported on the respective chain units of said chain and having side wing portions thereof slidingly rested on horizontal racks at the top of said inner and outer side walls of said base frame structure in horizontal alignment with each other to provide a planar meal-transferring surface on said endless circulating path of travel, each said crescent plate including a first concave edge and a second convex edge in opposition to said concave edge with the convex edge of one of said plates being nested in the concave edge of said next adjacent plate; driving means mounted on said base frame structure and associated with said endless conveyer for imparting translational movement thereto; a cover plate mounted overhead said circulating path of travel and supported on said inner side wall of said base frame structure by means of a number of posts in a parallel spaced

relationship with said meal-transferring surface of said endless conveyer.

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**3,895,692**

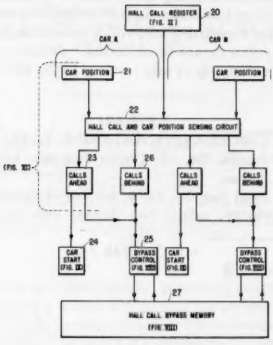
## ELEVATOR CONTROL

**Maynard C. Yeasting, Elmore, Ohio, assignor to The Reliance Electric and Engineering Company, Cleveland, Ohio**

**Continuation of Ser. No. 622,877, Feb. 7, 1967, abandoned, which is a continuation of Ser. No. 14,074, March 10, 1960, abandoned. This application Oct. 25, 1972, Ser. No. 300,704**

**Int. Cl. B66b** *1/20*

**U.S. Cl. 187—29** **26 Claims**




1. In an elevator control system, in combination, a plurality of cars arranged to serve a plurality of floors, means for registering calls for service, control means for each car for stopping the car at floors at which calls are registered, means for indicating the difference between the number of calls registered in the zones between the car and the next preceding and next following cars, auxiliary control means for each car adapted to de-energize the first control means for by-passing calls, and means operatively connected to said difference indicating means for actuating the auxiliary control means when the number of calls in the zone ahead of the car exceeds the number of calls in the zone behind the car.

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**3,895,693**

## DISC-BRAKES WITH GRAPHITE FRICTION LININGS

**Rene Lucien, Neuilley-sur-Seine, and Jean Masclet, Paris, both of France**

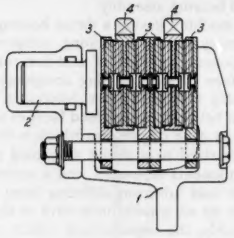
**Continuation of Ser. No. 114,476, Feb. 11, 1971, abandoned. This application June 14, 1973, Ser. No. 370,056**

**Claims priority, application France, Feb. 12, 1970, 70.05033; June 18, 1970, 70.22507**

**Int. Cl. F16d** *55/00, 69/02, 69/04*

**U.S. Cl. 188—71.1** **10 Claims**

1. A disk brake comprising a rotating and a non-rotating structure, both structures having facing surfaces and comprising friction linings on said facing surfaces capable of rubbing against each other, said friction linings of the two structures each being composed of a plurality of graphite plates, each of the said graphite plates having two parallel plane surfaces and a flat side surface having generatrices extending perpendicular to the two plane surfaces, said plates being housed in respective recesses in the structures and having a flat bottom, each recess having a depth less than the thickness of the respective plate, each structure including a disk element with a rim surrounding the associated recess and having a side face parallel to the said flat side surface of the associated plate, and means for securing each plate in its recess comprising a single rivet passing through each plate with radial clearance and secured to said disk element, said plate being secured in their



recesses with a clear circumferential space formed with said rim.

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**3,895,694**

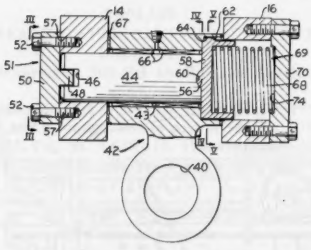
## GRAPPLE SNUBBING APPARATUS

**John R. Muntjanoff, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed July 11, 1974, Ser. No. 487,726**

**Int. Cl. F16d** *63/00;* **F16f** *13/02*

**U.S. Cl. 188—83** **14 Claims**



1. Apparatus for controlling oscillation of a first member relative to a yoke member defining first and second arm means, comprising:

a pin;

means for securing the pin from rotation about the longitudinal axis thereof relative to said first and second arm means;

a housing member secured relative to said first member and positioned between said first and second arm means and defining a bore through which said pin is disposed;

a retaining member disposed adjacent a first end of the pin and secured from rotation relative to one of the pin and housing member;

resilient means associated with the second arm means and retaining member for urging the retaining member away from the second arm means;

means for limiting movement of the pin under urging of the retaining member by the resilient means;

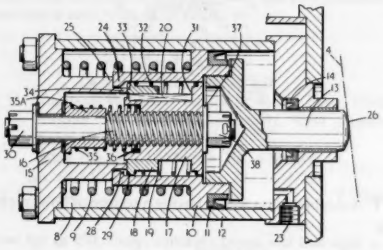
the one of the pin and housing member which is not secured from rotation relative to the retaining member, and the retaining member, together defining cooperating seatable protrusion and recess means, positioned so that rotation of the first member relative to the yoke member about the longitudinal axis of the pin causes unseating of the protrusion and recess means, against the resilience of the resilient means, from a seated position.

3,895,695

## SPRING APPLIED FLUID RELEASED BRAKE UNIT

Ian Pearson Hunter, Glossop, England, assignor to Davies & Metcalfe Limited, North Stockport, England

Filed Feb. 25, 1974, Ser. No. 445,701
Claims priority, application United Kingdom, Feb. 24, 1973, 9161/73
Int. Cl. F16d 65/24
U.S. Cl. 188—170 13 Claims



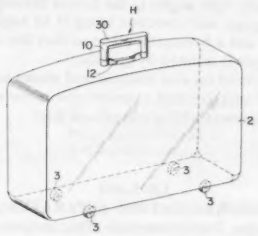
1. A spring brake unit in combination with first piston and cylinder means actuable by fluid pressure for causing operation of a brake, the spring brake comprising: second piston and cylinder means, the second piston being relatively movable in first and second opposite directions for causing brake application and brake release respectively, first spring means continually urging the second piston in said first direction but movement in said first direction being prevented by fluid pressure urging said piston in said second direction, until the fluid pressure falls below a predetermined value, a screw disposed in said second piston and cylinder means, said screw being mounted for inhibiting axial movement thereof in said first and second directions relative to the second piston and cylinder means, a nut threaded on said screw for rotation thereabout, said nut and second piston being arranged for engagement whereby relative rotary movement between the two is prevented when the second piston is moved in said first direction relative to a normal working position of the nut on the screw in the event of fluid pressure falling below said predetermined value, the engagement between the nut and second piston being arranged for the nut to move the second piston in the second direction when the nut is advanced in that direction from its normal working position by rotation of the screw, second spring means stressable by the movement of the nut in the second direction, stop means for abutment by the nut for preventing the latter moving the second piston in the second direction beyond a predetermined position, the second piston being movable in the second direction beyond the predetermined position for interrupting said engagement when fluid pressure above said predetermined value is applied to the second piston, whereby movement of the nut in the direction to its normal working position is effected by rotation of the nut relative to the second piston and the screw in response to force of the second spring means applied to the nut and in the event of said fluid pressure remaining below said predetermined value, the nut in engagement with the second piston being returnable in the first direction to the normal working position of the nut be rotation of the nut along the screw, whereby the second piston under the influence of the first spring means is permitted to move in the first direction.

3,895,696

## HANDLE FOR SUITCASES AND THE LIKE HAVING CASTERS

Yutaka Urushibara, 3-Chome, 7-4 Kanamachi, Tokyo, Japan

Filed Nov. 16, 1973, Ser. No. 416,632
Claims priority, application Japan, Aug. 13, 1973, 48-90014
Int. Cl.² A45C 13/26
U.S. Cl. 190—58 10 Claims



1. In a handle structure for a suitcase having rolling means at the bottom, the handle structure having a pair of longitudinally extensible parallel tubes connected to the suitcase at their proximal ends, and a grip connecting the distal ends of said tubes, said grip being capable of selectively taking a retracted position near said suitcase and an extended position more remote from said suitcase depending on the extension of said tubes:

the improvement comprising an inverted U-shaped body fixedly connected to said suitcase and including a central grip portion and two columnar portions extending perpendicularly at the two ends of the grip portion toward the suitcase, said columnar portions respectively receiving said extensible tubes such that the extensible tubes can extend outwardly of the columnar portions said central portion being located in a position in which it houses a portion of the grip and supports the surface of said grip facing the suitcase when the grip is in said retracted position, said grip portion having a shape and size such that when the grip is in the retracted position, said grip portion cooperates with the grip to form an apparently united single handle.

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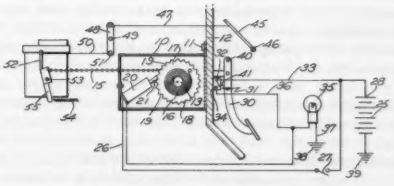
3,895,697

## BRAKE CONTROLLED THROTTLE HOLDING MEANS FOR VEHICLE

James A. Wilkins, Jr., 422 Sanford Rd., Westport, Mass. 02790

Filed May 8, 1974, Ser. No. 467,941
Int. Cl. B60k 29/02
U.S. Cl. 192—3 T 3 Claims



1. A throttle holding means for a vehicle comprising a fuel feeding means including valve means and an arm to operate the same,

an accelerator pedal to operate said arm,
a drum,
a flexible cable connected to said arm and said drum,
spring means to rotate said drum in one direction to wrap said cable about said drum,
a toothed cog gear attached to said drum to rotate therewith the teeth of said cogs each having a face inclined to the gear radius,
a solenoid having a plunger reciprocatable in a direction at substantially right angles to the face of the cog of the gear it is to engage, said direction being at an angle to a vertical plane and a horizontal plane so that the retraction of said plunger is assisted by gravity,
an electric circuit for said solenoid and means to control the circuit to energize said solenoid and move said plunger into engagement with a cog of said gear.

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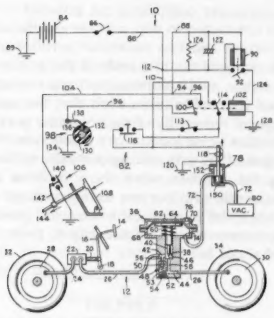
**3,895,698**

## BRAKE CONTROL APPARATUS

**John G. Fontaine, Fort Lauderdale, Fla., assignor to Fail Safe Brake Corporation, Fort Lauderdale, Fla.**

**Division of Ser. No. 300,128, Oct. 24, 1972. This application Oct. 4, 1974, Ser. No. 511,998**
**Int. Cl.[2] B60K *41/20*; B60T *17/16***
**U.S. Cl. 192—3 TR** **10 Claims**



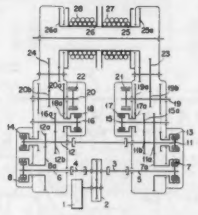
1. Apparatus for controlling hydraulic brakes of a vehicle in which brakes are applied by hydraulic pressure in a conduit responsive to depression of a brake pedal, said apparatus comprising two-way vacuum operated valve means in said conduit for closing said conduit to keep hydraulic pressure applied to the brakes after depression of said foot pedal and for opening to release the hydraulic pressure, and control means for operating said valve means including a first circuit having speed responsive means therein for breaking said first circuit when the vehicle is stopped, a second circuit having accelerator responsive means therein for breaking said second circuit when an accelerator of the vehicle is released, and a third circuit having solenoid valve means therein controlling a vacuum line for operating said two-way vacuum valve means, with the breaking of both of said first and second circuits causing energization of said solenoid valve means to close said two-way vacuum valve means for keeping the hydraulic pressure in said conduit applied to the brakes.

**3,895,699**

## DOUBLE DRUM WINCH

**Masazo Mita, and Masami Hashimoto, both of Osaka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

**Filed Mar. 14, 1974, Ser. No. 451,206**
**Claims priority, application Japan, June 13, 1973, 48-65835**
**Int. Cl. B66d *1/26***
**U.S. Cl. 192—4 R** **3 Claims**



1. A double-drum winch having a source of power, comprising:
a. high and low speed clutches connected to the source of power;
b. hook up and down moving clutches connected to said high and low speed clutches for upwardly and downwardly moving the hook;
c. boom up and down moving clutches connected to said high and low speed clutches for upwardly and downwardly moving the boom;
d. a hook brake connected to said hook down moving clutch;
e. a boom brake connected to said boom down moving clutch;
f. a hook drum connected to the brake shaft of said hook brake;
g. a boom drum connected to the brake shaft of said boom brake;
h. a hook operating valve for switching the hook up and down moving clutches and hook brake;
i. a boom operating valve for switching said boom up and down moving clutches and boom brake; and,
j. high and low speed switching control valve for switching said high and low speed clutches, whereby said boom and said hook may be independently operated.

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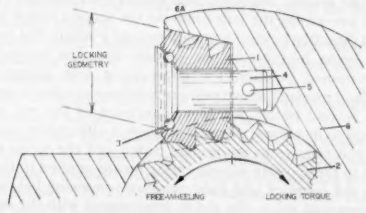
**3,895,700**

## WORM/WORM-WHEEL OVERRUNNING CLUTCH

**John Hugh Kerr, Kitchener, Canada, assignor to Ker-Train Systems N.V., Curacao, Netherlands Antilles**

**Filed Jan. 2, 1974, Ser. No. 429,610**
**Claims priority, application Canada, Jan. 9, 1973, 160906**
**Int. Cl. F16d *41/00***
**U.S. Cl. 192—41 R** **6 Claims**




1. A worm and worm-wheel gear assembly, the worm at least partially enveloping the worm-wheel in at least one direction over a subtended angle, the lands of the worm having at

least two surfaces each of which is congruent to a corresponding surface on the teeth of the worm-wheel to thereby form at least two pairs of congruent surfaces, wherein the congruent surfaces of one of said pairs are sloped so as to be relatively perpendicular to the axis of the worm throughout the subtended angle of envelopment and the congruent surfaces of the other of said pairs are sloped so as to be relatively parallel to the axis of the worm within said subtended angle, whereby rotation of the worm results from rotation of the worm-wheel when the congruent surfaces of said first pair are engaged and locking of the worm relative to the worm-wheel results when the congruent surfaces of said second pair are engaged, the locking characteristics of the assembly being independent of the coefficient of friction between said pairs of congruent surfaces within said subtended angle.

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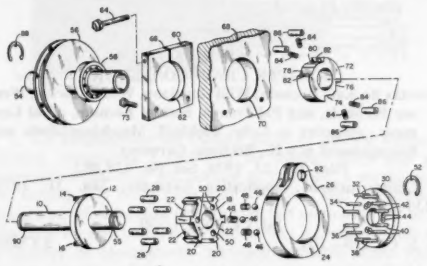
**3,895,701**

## TRANSMISSION SYSTEM

**Victor N. Albertson, deceased, late of St. Louis Park, Minn., and by Eleanor M. Albertson, executrix, 4094 Alabama Ave., St. Louis Park, Minn. 55416**

**Filed Dec. 10, 1973, Ser. No. 423,281**
**Int. Cl.[2] F16D** *3/34, 43/00, 21/00, 41/04*
**U.S. Cl. 192—44** **7 Claims**



1. Transmission apparatus mounted on a support structure and adapted to couple an oscillatory drive member to an output shaft for imparting intermittent rotational motion to said shaft comprising:

a. a mounting plate attached to said support structure and having a circular aperture formed therein of a predetermined diameter;

b. a tubular output shaft;

c. means for rotationally mounting said output shaft in the aperture in said mounting plate;

d. a clutch plate attached to said tubular output shaft and having a generally circular profile of a diameter slightly less than the diameter of said aperture in said mounting plate so as to be insertable therein and having first and second pairs of V-shaped notches diametrically apposed from one another cut in the periphery thereof, the notches in a pair being separated by a region of reduced clutch plate radius;

e. first and second pairs of rollers individually disposed in said V-shaped notches and each normally resiliently wedged between a wall of said V-shaped notch and the wall defined by the aperture in said mounting plate;

f. a driving shaft of a diameter slightly less than the inside diameter of said tubular output shaft so as to be slidably insertable therein in telescoping arrangement;

g. means secured to said driving shaft including projecting tabs movably inserted respectively into the regions of reduced clutch plate radius for moving one of the adjacent rollers out of engagement with the wall of the aperture in said mounting plate only when a torque is applied thereto;

h. coupling means attached to said driving shaft adapted to be connected to a source of oscillating motive power; and

i. directional control means operatively cooperating with said coupling means for causing said driving shaft to rotate in a clockwise or counter-clockwise direction depending on the setting of said directional control means.

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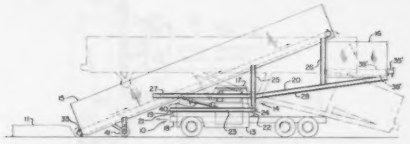
**3,895,702**

## LOADING APPARATUS

**Alfred T. Newsom, Rte. 4, Box 4, Brownfield, Tex. 79316**

**Filed Mar. 5, 1974, Ser. No. 448,335**
**Int. Cl.[2] B65G** *41/00, 67/08*
**U.S. Cl. 198—11** **3 Claims**



1. Apparatus for loading bulk material piled on the ground into a high-sided cargo body comprising

a frame mounted on a self-propelled vehicle and having a stationary base section extending longitudinally of the vehicle and secured thereto at the front and medial portions of said vehicle,

the frame having a movable section pivotally attached at its intermediate portion to the base section of said frame at the medial portion of said vehicle for forward and rearward swinging between forwardly inclined and substantially horizontal positions,

a pick-up conveyor secured to and oriented longitudinally of the movable section of said frame and being so positioned thereon that its front end closely approaches the ground upon forward pivoting of said movable frame section and that the pick-up conveyor is oriented substantially horizontally when said section is pivoted rearwardly,

means for pivoting said movable frame section between and for maintaining it in its forwardly inclined and substantially horizontal positions, and

a transfer conveyor mounted on said movable frame section for movement therewith and oriented transversely thereof,

the transfer conveyor being disposed below and behind the rear end of said pick-up conveyor and having one of its ends projecting laterally beyond the latter conveyor.

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**3,895,703**

## COMBINED STEERING CLUTCH AND BRAKE CONTROL FOR CRAWLER TRACTORS

**James L. Schmitt; Clarence L. Castle, Jr., both of Washington, and Orville E. Kessinger, Jr., Mackinaw, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Oct. 26, 1973, Ser. No. 409,865**
**Int. Cl. F16d** *67/02;* **E03b**
**U.S. Cl. 192—13 R** **7 Claims**

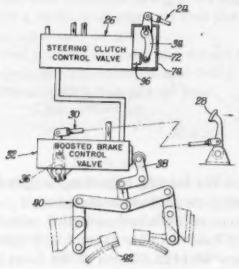
1. In combination with a vehicle in which driving force is applied to both sides thereof, clutch and brake systems associated respectively with both sides thereof and responsive to fluid pressure from a source thereof for steering of the vehicle, each clutch and brake system associated with a side of the vehicle comprising:

clutch means disengageable to disconnect the driving force applied to that side of the vehicle upon application of fluid pressure thereto;

brake means actuatable upon application of fluid pressure thereto to brake that side of the vehicle;

valve means associated with said fluid pressure source and including a reciprocable valving spool positionable in (i) a first position blocking fluid pressure from said clutch means and said brake means and movable sequentially to (ii) second and (iii) third positions, said spool in said

second position allowing fluid pressure from said source through said valve means to said clutch means to disengage said clutch means, but blocking fluid pressure from said brake means, said spool in said third position allowing fluid pressure from said source through said valve means to said clutch means to maintain said clutch means in its disengaged state and allowing fluid pressure from said source through said valve means to said brake means for actuating said brake means;




an actuating member connected with said valving spool so that movement of the actuating member to first, second and third sequential positions moves the valving spool to its first, second and third sequential positions respectively; and

means independent of said valve means for selectively allowing fluid pressure from said fluid pressure source to said brake means, so that the brake means may be actuated with the clutch means in an engaged state.

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**3,895,704**

## WORD PROCESSOR WITH RIGHT-HAND MARGIN CONTROL

**Richard C. Norris, Belmont, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.**

**Filed May 18, 1972, Ser. No. 254,750**

**Int. Cl. B41j** *5/30*

**U.S. Cl. 197—19** **23 Claims**

1. Apparatus for processing data in conjunction with formation of characters and performance of selected functions by a printer having a printing means for forming printed characters on a record medium, a carrier for said record medium, means for moving said carrier and printing means relative to one another in increments of distance along a line between a beginning-of-line position and an end-of-line position, means for moving said record medium substantially perpendicularly to said line, and printer control means for controlling said printer to form said characters responsively to corresponding coded character signals and to perform said functions responsively to corresponding coded function signals, said apparatus comprising in combination:

signal storage means for storing a plurality of said coded character and function signals;

means for applying a plurality of said coded character and function signals to the input of said storage means for storage therein;

means for coupling the output of said storage means to said printer control means so that said printer control means is responsive to coded character and function signals appearing at the output of said storage means; and

anticipatory margin adjust means, operative when said printing means and carrier are in a predetermined position on said line relative to one another intermediate said beginning-of-line position and said end-of-line position, for examining a predetermined plurality of those signals stored in the part of said storage means which would affect the operation of the printer during relative movement of said printing means and carrier between only said predetermined position and said end-of-line position, to determine if any of the examined signals correspond to any of selected ones of said coded character and function signals, said examining being completed prior to any response by said printer control means to any of said plurality of signals.

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**3,895,705**

## SCRAPER CHAIN CONVEYOR

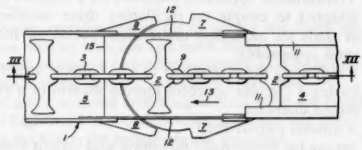
**Gustav Bockau, Bochum; Willi Gormann, Wanne-Eickel; Werner Fernholz, and Pal Frenyo, both of Bochum, all of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany**

**Filed Jan. 23, 1974, Ser. No. 435,882**

**Claims priority, application Germany, Jan. 31, 1973, 2304560**

**Int. Cl. B65g** *41/00*

**U.S. Cl. 198—109** **5 Claims**



1. A scraper chain conveyor comprising:

a driven chain having links constructed from material that is round in cross section;

a plurality of flight attachments each having a length extending transverse to said chain, said flight attachments being connected centrally between their opposite ends to said chain at spaced-apart locations for receiving a pulling force transmitted by said driven chain;

a conveyor channel including at least first and second channel sections connected together in an end-to-end relation by a pivotal interconnection for angularly positioning one section with respect to the other about an axis extending in a direction normal to the conveyor direction;

said first channel section extending downstream from said pivotal interconnection with respect to the conveying direction, said first channel section having a downwardly sloping chain support floor commencing from a transverse plane immediately adjacent said pivotal interconnection and sloping downwardly in the downstream direction; and

top guides extending along opposite sides of said second channel section for said flight attachments, said top guides each having one of their terminal ends lying in a

transverse plane adjacent to and upstream of said pivotal interconnection, the forces acting on said chain and said flight attachments due to the pull on the driven chain and said downwardly sloping chain support floor being such that as said chain passes along an arcuate path at the pivotal interconnection, the chain intersects points in said transverse planes, the maximum height of said arcuate path from a subtending cord through said points of intersection is smaller than one-half the length of a flight attachment.

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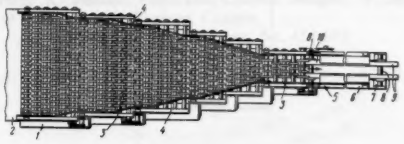
## 3,895,706
## ARRANGEMENT FOR FEEDING THE BULBS OF ELECTRIC VACUUM DEVICES

**Solomon Isaakovich Levin, ulitsa Sovetskaya 79, kv. 12; Valentin Terentievich Samonov, ulitsa Svetotekhniki 53, kv. 49; Nikolai Ivanovich Tsygankin, ulitsa Anny Luss, 2, kv. 25, and Nadezhda Serafimovna Khoroneko, ulitsa Svetotekhnik, 119, kv. 41, all of Saransk, U.S.S.R.**

**Filed May 11, 1973, Ser. No. 360,373**
**Int. Cl. B65g** *13/04*
**U.S. Cl. 198—127 R** **2 Claims**



1. An arrangement for feeding bulbs of electric vacuum devices, comprising a conveyor for loading bulbs into an automatic exhausting and sealing-off machine, a mechanism for feeding said bulbs onto said conveyor, said mechanism being a set of successive first through last sections in the feed direction for said bulbs, each said section including a train of a number of consecutively arranged rotatable shafts each having a number of disks mounted thereon, rotation of which is adapted to set said bulbs into progressive motion, the number of the shafts in at least some of said successive sections being less than that in a preceding section, the disks on each following shaft in each respective section being of a diameter larger than the disks on the preceding shaft in said section, disks of different diameters being mounted on a last shaft in all of said sections and on all of the shafts in the last section in the feed direction of said bulbs providing lateral orientation of the bulbs so as to align the latter in the feed direction thereof, the increase in diameter of the disks in the feed direction of the bulbs imparting an increased linear feed velocity to the latter for conveying the bulbs into the machine.

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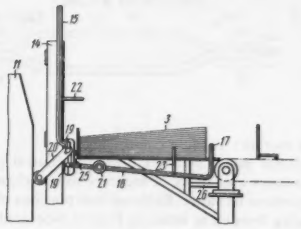
## 3,895,707
## CONVEYOR FOR TRANSPORTING PLIES OF NEWSPAPERS

**Nikolia Ivanovich Anikanov, Bolshaya Bronnaya ulitsa, 2/6, kv. 6; Leonid Pavlovich Grachev, ulitsa Lva Tolstogo, 7, kv. 32; Grigory Avramovich Radutsky, 16 Parkovaya ulitsa, 49, korpus 2, kv. 68, all of Moscow, and Rafail Efimovich Kheifets, Brest-Litovsky prospekt, 162, kv. 30, Kiev, all of U.S.S.R.**

**Filed June 12, 1974, Ser. No. 478,717**
**Claims priority, application U.S.S.R., Jan. 18, 1974, 1983003**
**Int. Cl. B65g** *17/18*
**U.S. Cl. 198—179** **3 Claims**

1. A conveyor for transporting piles of newspapers, comprising: an endless driven chain running three-dimensionally along a path having loading and unloading portions; a drive associated with said chain; carriages mounted on said chain for joint travel therewith; a clamp mounted on each said carriage, and including a pair of fork-shaped flaps forming a box-like receptacle adapted to receive a pile therein; a pivot pin supported by said carriage, with one of said flaps being pivotally mounted on said pivot pin for pivoting in a vertical plane, with said flap having the prongs thereof bent toward the prongs of the other said flap to retain a pile within said box-like receptacle during travel of said chain; another pivot pin also supported by said carriage, with said other flap being



pivotally mounted on said another pivot pin for pivoting in a vertical plane, with the endmost of said prongs of said respective fork-shaped flaps having less space from one another than the rest of said prongs; and with said flaps being pivotable in a vertical plane to open said box-like receptacle for the loading and unloading thereof.

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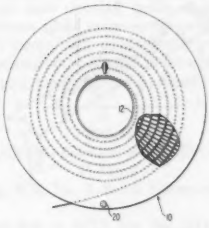
## 3,895,708
## CONNECTOR PLATE COIL

**John C. Jureit, Coral Gables; Ben Kushner, and Adolfo Castillo, both of Miami, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.**

**Filed Jan. 7, 1974, Ser. No. 431,046**
**Int. Cl. B65h** *75/28*
**U.S. Cl. 206—53** **7 Claims**



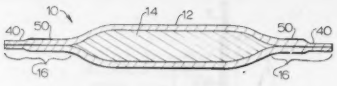
1. An industrial product comprising a reel having a hub and a flange disposed adjacent at least one end of said hub and extending radially outwardly therefrom, and an elongated strip of sheet metal connector plate stock coiled about said hub and supported by said reel, said connector stock having a plurality of spaced elongated nail-like teeth struck integrally therefrom and projecting generally radially from one side of said coiled stock in a plurality of transversely spaced longitudinal rows extending substantially coextensively with the length of said coiled stock, said stock being helically coiled about said hub in successive opposite axial directions and at a predetermined pitch in each direction to form a plurality of generally concentric cylindrical coils of said stock about said hub with said flange limiting the axial extent of the helically coiled stock in one of said axial directions.

3,895,709

## METAL MERCURY CAPSULE

George J. Przybylek, Scotch Plains, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 27, 1973, Ser. No. 355,178
Int. Cl. B65d 81/00; H01j 61/20
U.S. Cl. 206—84 2 Claims




1. A mercury capsule comprising:

a tubular metal member having a central portion which contains a quantity of mercury to be released therefrom to obtain its vapor, flattened end portions of said member being bonded in intimate face-to-face contact with each other at both ends of said member to provide a hermetic seal for said capsule, and intermediate closed portions between said bonded end portions and said central portion,

said intermediate portions being formed of the walls of said tubular member lightly crimped together to contain the mercury liquid in said central portion, said intermediate portions being openable under elevated mercury vapor pressure at which said hermetically sealed closed end portions are not openable whereby said capsule can be exposed to heat without being ruptured and without permitting mercury to escape.

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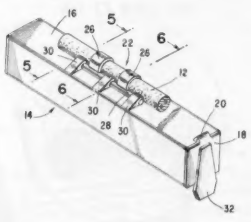
3,895,710

## DRILL AND BLADE HOLDER FOR PORTABLE ELECTRIC TOOL

Don L. Harvell, Greenville, S.C., assignor to The Singer Company, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,229
Int. Cl.[2] B65D 85/54
U.S. Cl. 206—349 1 Claim




1. A drill and blade holder for attachment to a variably sized cord of a portable electric power tool comprising:

a. a one piece molded elongated receptacle having a plurality of walls and a pivotally connected end cover,

b. a strap means including a pair of pedestal bases integrally formed on the exterior of one of the walls in spaced relation to each other, a thin flexible strap element extending from each of the pedestal bases, and a locking bar extending parallel to the wall integrally connected at the ends of the strap elements intermediate the free ends of the locking bar,

c. a plurality of locking projections formed integrally with the wall and spaced from each other along the length of the wall a total distance substantially equal to the length of the locking bar,

d. each of the locking projections spaced with respect to the pedestal bases alternately along the length of the wall, and

e. the locking bar to successively engage the locking projections upon the strap elements encircling the cord to be interconnected therewith, whereby said holder will be attached to the cord.

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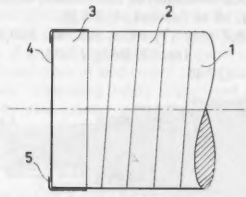
3,895,711

## WRAPPED, PREFERABLY CYLINDRICAL, PRODUCT AND A METHOD OF FARMING SAID PRODUCT

Mikko Hiltunen, and Kaarlo Halmekyto, both of Helsinki, Finland, assignors to Oy Transpak Ab Consulting, Helsinki, Finland

Filed June 20, 1973, Ser. No. 371,713
Claims priority, application Finland, June 28, 1972, 1848/72; Jan. 16, 1973, 102/73
Int. Cl. B65d 85/671, 85/66
U.S. Cl. 206—413 12 Claims




1. A method of wrapping a product, such as a paper roll, particularly for increasing the waterproofing and shockproof qualities thereof, which comprises winding an elastic wrapping band around the end of the product so as to form a protecting hoop at the edges of said end, while keeping part of said band extending over the edge of the product and stretching the band so that, owing to its mechanical elasticity, the band contracts tightly against the end surface of the product during wrapping.

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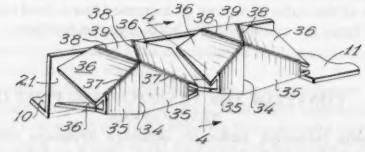
3,895,712

## PROTECTIVE CONTAINER

William G. Sieffert, Joliet, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Aug. 30, 1974, Ser. No. 502,046
Int. Cl.[2] B65D 5/02, 85/30
U.S. Cl. 206—424 18 Claims




1. In a die-cut blank made from corrugated paperboard or similar sheet-like material and adpated to be folded into a carton for an article such as books or the like, said blank including:

a substantially rectangular sheet of said material having parallel top and bottom edges, and parallel lateral edges; three vertical, parallel, spaced-apart fold lines arranged intermediate said lateral edges defining four rectangular panels;

said four panels including a top panel, a bottom panel, a first side panel positioned between said top and bottom panels, and a second side panel; the improvement comprising:

a protective cell wall flap connected to said bottom panel at one end thereof by a cell wall flap hinge line;

said cell wall flap hinge line spaced from said end of said bottom panel by a section of said material having a pattern of cuts and score lines formed therein defining at least one isosceles triangle having its base perpendicular to said cell wall flap hinge line and also defining a pair of support sections hingedly connected along the equal sides of said isosceles triangle;

a first of said support sections also connected along a first hinge line extending from the base of said isosceles triangle to said bottom panel; and

the second of said support sections also connected along a second hinge line extending from the base of said isosceles triangle to a hinged connecting segment which is also hingedly connected to said protective cell wall flap. said support sections having at least four sides and foldable outwardly along with said isosceles triangle to form a cell structure having at least one edge of each of said support sections in edge abutting relationship with the surface of said cell wall flap.

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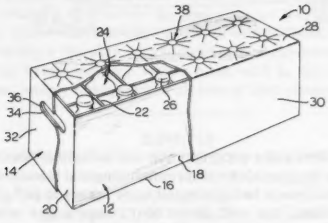
## 3,895,713
## CONTAINER COVER STRUCTURE

**Arthur K. Bunnell, Etobicoke, Canada, assignor to Carling O'Keefe Limited, Toronto, Canada**

**Filed Apr. 10, 1974, Ser. No. 459,605**
**Int. Cl. B65d** *85/00*
**U.S. Cl. 206—427** **17 Claims**




1. A container structure including

a tray member having a base and side walls and end walls upstanding from said base and terminating in an open top, divider means situated in said tray member and extending upwardly from said base, said divider means forming with said side and end walls a plurality of individual compartments in each of which is situated a digit-grip removal item,

closure means closing said open top to provide a cuboid form closed structure, said closure means being a disposable sleeve of light cardboard material, said disposable sleeve including a top panel extending coextensively with the open top of the tray member and side and end panels integral with said top panel and extending downwardly from said top panel in frictional gripping engagement with the side and end walls of the tray member and the height of said walls inhibiting removal of said sleeve from association with said tray member, and

a plurality of openable seal means located in said closure means, one of said plurality of said means being associated with each of said individual compartments,

each of said plurality of openable seal means being formed in said top panel and including a plurality of score lines along which the material of said top panel may tear and extending radially towards the lateral extremities of the compartment sealed thereby, the radially outer extremities of said score lines lying on a circle, said score lines defining a plurality of segments bendable about crease lines extending between the outer extremities of said score lines, whereby, upon breaking open one of said seal means by tearing along the plurality of score lines thereof, access may be had to the item in the compartment with which the broken sealing means is associated without breaking open the sealing means of other of said compartments.

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## 3,895,714
## CONTAINER FOR CASSOU STRAWS

**Frederick Day, Box 98, Winterburn, Alberta, Canada**

**Filed June 4, 1973, Ser. No. 367,000**
**Claims priority, application Canada, May 5, 1972, 141346**
**Int. Cl. B65d** *85/20*
**U.S. Cl. 206—443** **3 Claims**

1. In combination:

a container for holding Cassou straws in a cannister; and

a plurality of Cassou straws disposed in the container;

said container being tubular, closed at the bottom end and open at the top, and having sufficient length so as to extend to the top lip of the cannister when placed therein, said container further having a window opening in its side wall intermediate its ends, said opening being spaced above the bottom closure a predetermined distance and being sized so that the upper ends only of the straws are located at the opening and are exposed for identification and removal, said opening being of sufficient size to permit a Cassou straw to be withdrawn therethrough;

said container comprising upper and lower segments, the side wall opening being located in the upper segment, said segments being held together frictionally.

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## 3,895,715
## NESTING-STACKING CARRIER HAVING HINGED SIDE WALLS

**Clarence Drader, R.R. No. 2, South Edmonton, Alberta, Canada**

**Filed Feb. 9, 1973, Ser. No. 331,000**
**Int. Cl. B65d** *21/06*
**U.S. Cl. 206—506** **1 Claim**

1. A nesting-stacking carrier comprising:

a bottom floor member;

upstanding side wall members hingedly attached along their lower edges to the floor member so that they can be rotated between a substantially vertical stacking position and an outwardly slanted nesting position;

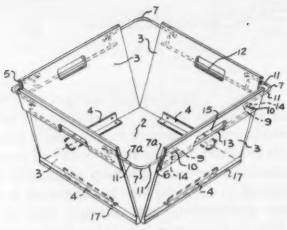
each said side wall member forming handle and arm-receiving passages;

a plurality of rigid right-angle members, one such member connecting each pair of adjacent side wall members at the upper corners thereof, each said right-angle member comprising a pair of arms which are horizontally slidable into the arm-receiving passages; as the side wall members are shifted from the nesting to the stacking position, each said arm having a locking shoulder formed thereon;

a handle member horizontally positioned in the handle-receiving passage and having upwardly turned end portions, said handle member being shiftable upwardly in said passage;

each side wall member defining an opening through which its handle member extends whereby it may be grasped;

spring means, carried by each side wall member in the handle-receiving passage, for normally urging the handle member upwardly so that its end portions contact the



adjacent arms and abut the locking shoulders thereof, thereby locking the side wall members in the stacking position;

each said side wall member carrying catch means adapted, when the handle member is pressed downwardly to release the arms so that the side wall member may be shifted outwardly, to contact the adjacent locking shoulder to limit the outward rotation of the wall members to the nesting position.

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**3,895,716**

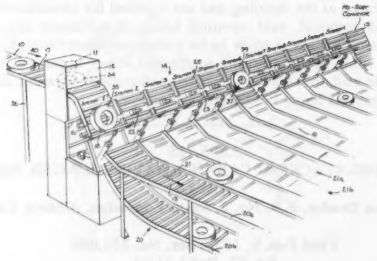
**TIRE SORTING APPARATUS**

**John W. Ugo, Warren, Mich., assignor to Uniroyal, Inc., New York, N.Y.**

**Filed Dec. 27, 1971, Ser. No. 212,143**

**Int. Cl. B07c**

**U.S. Cl. 209—74 M** **28 Claims**



1. An apparatus for sequentially moving articles in step by step increments through a series of diverter stations onto selected ones of a plurality of branch conveyors in association with the diverter stations, comprising:

sensor means for developing code signals defining the selected ones of the plurality of branch conveyors onto which the articles are to be transferred, said sensor means being located remotely from the branch conveyors so as to permit a plurality of the articles to be in transit simultaneously therefrom to the selected branch conveyors thereof, after said sensor means develops the code signals therefor; and

memory means for storing the code signals developed by such sensor means, said memory means including a plurality of serially connected logic circuit means releasing selectively the code signals stored therein so as to transfer designated articles from the diverter stations onto the selected branch conveyors adjacent thereto,

said code signals moving through said serially connected logic circuit means in step by step increments which are in time relationship with the step by step incremental movement of said articles from diverter station to diverter station.

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**3,895,717**

**DEVICE FOR PROGRAMMING AND SELECTING DOCUMENTS**

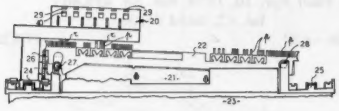
**Michel Gerard Schimmerling, 30, rue de la Liberte, 67380 Lingolsheim, France**

**Filed June 11, 1974, Ser. No. 478,349**

**Claims priority, application France, June 15, 1973, 73.22591**

**Int. Cl.[2] B07C**

**U.S. Cl. 209—80.5** **7 Claims**

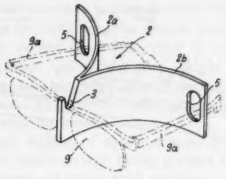


1. In a device for programming and selecting documents having an edge provided with programming and selection tabs, the said documents being adapted to be arranged pell-mell in a filing cabinet, the said device also comprising a selection carriage adapted to be dispaced above the documents in order to select the same by raising at least one side of the selected documents in accordance with data registered in the form of the said tabs which are either absent or present, corresponding to binary information 0, 1, the said carriage being provided with a set of feelers, each travelling opposite the location of one of the said document tabs, the selection being performed by first raising the documents and then lowering the discrepant documents each time the carriage passes above the documents and repels, by at least one of its feelers, an opposite present selection tab of the document, the improvements consisting in that the feelers are mounted juxtaposed on the carriage, each opposite the location of an information tab, and means are provided to maintain according to the desired programming and selection (a) some of said feelers in a lower position in which they either meet, during translatory motion of the carriage above the documents, opposite present tabs or freely pass above the document in the space left free by the absence of a tab and (b) to maintain other feelers in an upper position in which they freely pass during the translatory motion of the carriage above the documents, irrespective of the presence or absence of opposite tabs, each said feeler being mounted on a fork in turn mounted on a pivot pin, said fork having a tooth, a programming disk, having an edge upon which said tooth bears and being formed with slots adapted to receive said tooth for predetermined angular orientations of the said programming disk, said upper and lower positions of the feelers being determined by whether the tooth of the corresponding fork is engaged in a slot of the programming disk, a disengaging lever, and a locking and resilient-return mechanism which acts upon said lever to allow a tooth of the fork to be disengaged from the slot of the programming disk and being effective to rotate said disk to another relative angular position and thereby also the tooth of the fork.

## 3,895,718
## DISPLAY STAND FOR EYEGLASSES

Pierre Francois Xavier Seiller, Lagnieu-Ain, France, assignor to Le Presentroir Seiller, Langnieu, Ain, France

Filed Sept. 12, 1973, Ser. No. 396,428
Claims priority, application France, Sept. 20, 1972, 72.33914
Int. Cl. A47f 7/02
U.S. Cl. 211—13 4 Claims

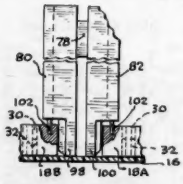


1. A display stand for eyeglasses or the like comprising a support and at least one generally V-shaped holder secured to said support in a generally horizontal position, said holder having a pair of outwardly curved elastically bendable V-legs each formed adjacent its free end with a throughgoing hole adapted to receive an earpiece of a pair of eyeglasses, said holder further having an apex formed with an upwardly open notch adapted to receive the nosepiece of the pair of eyeglasses whose earpieces are received in said holes, said support having a plurality of parallel vertical elements, each of said legs being provided with a hook next to the respective hole and snugly engageable with one of said elements.

## 3,895,719
## SUPPORTING DEVICE FOR PRINTED CIRCUIT BOARDS

Dennis Ronald Cakora, Braidwood, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 22, 1974, Ser. No. 462,639
Int. Cl. H02b 1/02
U.S. Cl. 317—101 DH 9 Claims



1. In a multi-connector assembly for electrically interconnecting a plurality of circuit carrying boards to a plurality of electrical connectors and including an open-top frame internally supporting said electrical connectors, said connectors facing said open top and arranged in an end-to-end pattern with a space between adjacent ends of adjacent connectors, a support guide for supporting adjacent edges of said boards when interconnected to said adjacent connectors and including

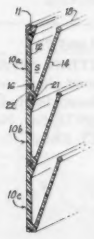
support means insertable in said space between said adjacent connector ends and including a pair of spaced apart vertical uprights with upper and lower end portions and opposite outer sides, each of said outer sides including means for receiving one of said edges of each of said boards,

a bridge member on the upper end portions of said uprights joining said uprights, and alignment means disposed on each of the lower end portions of said uprights for cooperating with the adjacent connector to align each upright and said receiving means with respect to said adjacent connector.

## 3,895,720
## RACK FOR TICKETS AND THE LIKE

Charles D. Presberg, 400 N. Michigan Ave., Deerfield, Ill. 60611

Filed Oct. 15, 1973, Ser. No. 406,299
Int. Cl.² A47F 7/00, 3/14
U.S. Cl. 211—50 3 Claims

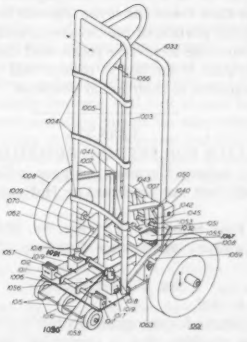


1. A modular one piece, rack section adapted to be assembled in multiple to provide a plurality of racks to receive cards and like articles comprising a spine, at least one thin, flat wing outstanding from said spine at an acute angle therewith defining a pocket to receive the articles, adjacent sections having respective male and female members of elongated tongue and groove means, said means being adapted for end-to-end assembly only by relative translational movement in the direction of the ends, at least a portion of the length of one of said means having an enlarged transverse cross section congruent with a corresponding cross section of the other of said means to preclude disconnection by force applied transversely of the assembly.

## 3,895,721
## INDEXING PANEL INSTALLER

Carl D. Russell, Tulsa, Okla., assignor to Aquarius, Inc., Lawton, Okla.

Continuation-in-part of Ser. No. 94,100, Dec. 1, 1970, abandoned, and a continuation-in-part of Ser. No. 56,833, July 21, 1970. This application July 28, 1972, Ser. No. 274,136
Int. Cl. E04f 21/18
U.S. Cl. 214—1 H 31 Claims



6. The construction panel handling apparatus for assembling a single panel to one or more panels comprising, in combination means for releasably gripping the single panel; means for moving the single panel up and down along its

longitudinal axis relative to said one or more panels; means for moving the panel right and left at substantially right angles to the direction of up and down movement generally along its axis 90° to the longitudinal axis in the plane of the single panel; means for tilting the panel clockwise or counterclockwise of the direction of up and down movement in the plane of said axes; means for tilting the panel forwardly or rearwardly of the direction of up and down movement in a direction generally orthogonally of said axes; means for reciprocally moving the gripping means along a predetermined path to contact the single panel against said one or more panels; and support means for the means for moving.

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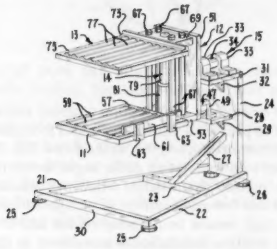
**3,895,722**

## BOX INVERTING APPARATUS

**Darrell E. Pluntz, Greenwood, Ind., assignor to Inland Container Corporation, Indianapolis, Ind.**

**Filed Dec. 20, 1973, Ser. No. 426,512**
**Int. Cl. B65g** *7/00*
**U.S. Cl. 214—1 Q** **1 Claim**



1. Apparatus for inverting boxes of different heights on a conveyor, comprising, a lower conveyor segment, a stop plate on the downstream end of said lower conveyor segment for stopping a box thereon, a rotary carrier plate for supporting said lower conveyor segment aligned with the upstream portion of a conveyor, an upper conveyor segment moveably supported on said carrier plate, said upper and lower conveyor segments each including a plurality of parallel rollers for supporting the boxes, a pneumatic cylinder coupled to said upper conveyor segment for moving same toward and away from said lower conveyor segment to clamp and release, respectively, a box therebetween and provide full support of its top and bottom flaps, and a rotary mechanism for rotating said carrier plate about 180° such that said upper and lower conveyor segments are inverted, said pneumatic cylinder being operated after the inversion of said segments to release the box with the then lower conveyor segment in alignment with the downstream portion of the conveyor, said rotarty mechanism being operable to reverse rotate said carrier plate about 180° after release of the box to restore said upper and lower conveyor segments to their initial positions.

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**3,895,723**

## APPARATUS FOR FEEDING ROD-SHAPED STOCK

**Paul Stolzer, Achern, Germany, assignor to Keuro Maschinenbau Gesellschaft mit beschränkter Haftung & Co., Achern, Germany**

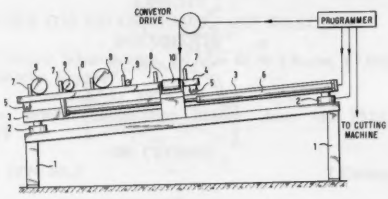
**Filed Sept. 10, 1974, Ser. No. 505,030**
**Claims priority, application Germany, Sept. 14, 1973, 7333342**
**Int. Cl.[2] B65G** *37/00*
**U.S. Cl. 214—1 P** **11 Claims**

1. An apparatus for automatically feeding rod-shaped stock to a cutting machine that is controlled by a programmer, comprising in combination:

a. a conveyor for transporting rod-shaped stock, said conveyor having an input zone in which the conveyor receives the stock, a conveying path along which the conveyor advances the stock to the cutting machine and a discharge zone in which the stock is introduced from the conveyor into the cutting machine;

b. frame means defining a series of juxtaposed compartments for accommodating the rod-shaped stock in an orientation parallel to said conveying path, said series extending transversely to said conveying path and crossing the same in said input zone of said conveyor;

c. first power means for moving said frame means transversely to said conveying path for aligning a selected one




of said compartments with said conveyor; said first power means being controlled by said programmer; and

d. second power means for raising said frame means from a lowered position clear of said conveyor prior to moving said frame means by said first power means and for lowering said frame means for bringing said selected compartment into said input zone of said conveyor for lifting, by said conveyor, the rod-shaped stock in said selected compartment off said frame means for transportation along said conveying path; said second power means being controlled by said programmer.

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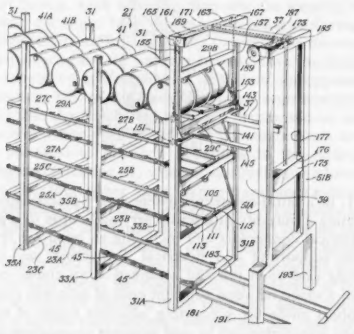
**3,895,724**

## GRAVITY TYPE DRUM RACK WITH AN UNLOADING MECHANISM

**Homer T. Thompson, 1821 Muse, Fort Worth, Tex. 76112, and Herschel D. Terrell, Jr., 3928 Wosley, Fort Worth, Tex. 76133**

**Filed Mar. 4, 1974, Ser. No. 447,945**
**Int. Cl. B65g** *1/06*
**U.S. Cl. 214—16.4 R** **3 Claims**



1. A drum feed rack comprising:

a plurality of pairs of spaced rails,

each pair of rails being located at a different level and inclined downward toward an unloading end for supporting and storing a plurality of cylindrical drums on their sides and for allowing the drums to roll on said rails,

a plurality of spaced spacer means coupled along the length of each rail forming a plurality of pairs of spacer means for each pair of rails for holding the drums spaced from each other and for allowing the drums sequentially and separately to roll forward on said rails toward said un-

loading end when the first drum on each pair of rails next to said unloading end is removed,

movable stop means for each of a number of pairs of upper rails,

each movable stop means being located at said unloading end of said rack for holding the first drum of each of said upper rails next to said unloading end and for releasing the first drum to allow it to roll off of the rails,

a carriage for unloading drums from said rails and adapted to move vertically from a feedout position upward and downward next to said unloading end of said rack whereby said carriage may be located next to each of said upper rails for removing the drums therefrom,

cable means or the like connected to said carriage and extending over reel means to a weight means having a weight greater than that of said carriage such that said weight means will pull said carriage upward when a drum is not located thereon,

the combined weight of said carriage and a drum when located on said carriage being greater than that of said weight means whereby said carriage, when carrying a drum will be lowered downward to said feedout position,

a movable engaging means for each of said upper rails and which is coupled to its associated movable stop means,

each engaging means being adapted to extend in the path of travel of said carriage, as it moves upward, when a drum is on its associated rails next to the unloading end of said rack,

each engaging means being adapted to release its stop means and to stop the upward travel of said carriage when extending in the path of travel of said carriage and engaged by said carriage as it moves upward to release the first drum on its associated rails to allow it to roll onto said carriage for transportation down to said feedout position.

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**3,895,725**

## MOVABLE BOBBIN TRANSPORT APPARATUS

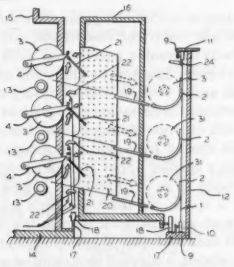
**Manfred Mayer, Remdcheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany**

**Filed May 10, 1972, Ser. No. 252,309**

**Claims priority, application Germany, May 13, 1971, 2123689**

**Int. Cl. D01h** *9/10*

**U.S. Cl. 214—41** **19 Claims**



**1.** The combination of a textile machine having bobbin winding stations positioned along a face thereof in multi-level rows and spatially arranged in a predetermined geometric pattern consisting of a lattice of several long, vertically spaced, horizontal rows and many vertical columns, and a bobbin transport unit movable along said face for transportation from the winding stations of wound bobbins, said transport unit being characterized by a longitudinal series of a plurality of longitudinally movable, longitudinally aligned, bobbin-receiving sections, each section being shorter in length than the length of said face, each section having a plurality of bobbin-receiving means for receiving respective finished bobbins doffed from said stations and the bobbin-receiving means being arranged in a geometric pattern of vertically spaced, horizontal rows of same number as in said rows of said lattice with a much smaller number of bobbin-receiving means in each section than the total number of said bobbin winding stations.

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**3,895,726**

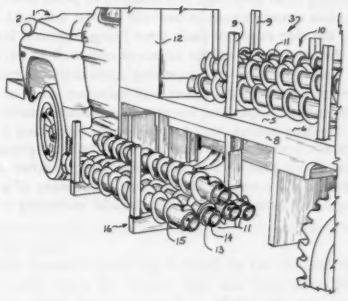
## MOVABLE AUGER RACK

**Charles L. Rassieur, University City, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.**

**Filed Mar. 20, 1973, Ser. No. 342,955**

**Int. Cl. B60p** *3/00*

**U.S. Cl. 214—83.24** **6 Claims**



**1.** A truck vehicle for carrying drilling augers including a bed for bearing equipment, said bed having a longitudinal axis comprising:

an undercarriage supporting said bed, said undercarriage including a main truck beam traversing said bed longitudinally, said truck beam being spaced from said bed;

means for carrying a plurality of drilling augers beneath said bed, at least a portion of said carrying means being mounted for movement with respect to said vehicle, said carrying means comprising shim means mounted to said truck beam and positioned above said truck beam, between said truck beam and said truck bed; spacer means abutting said shim means and positioned above said shim means between said shim means and said truck bed, a track mounted to said vehicle for confining movement of a dolly structure, said track being positioned generally athwart of said longitudinal track vehicle axis, between said spacer means and said truck bed; a dolly structure mounted for movement along said track in a direction generally athwart of said longitudinal track vehicle axis between at least a first position and a second position, a rack for holding said drilling augers mounted cantilever fashion to said dolly structure and movable with said dolly structure between said first and said second positions, said rack being outboard of said bed in said first position and substantially beneath said bed in said second position, said rack including means for supporting said drilling augers along at least two points and side wall means for permitting stacking of said augers in said rack; and means for moving said dolly structure between said first and second positions.

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**3,895,727**

## POULTRY TRANSPORT SYSTEM

**Stanley E. Rucker, 8 Highland Dr., St. Charles, Mo. 63301**

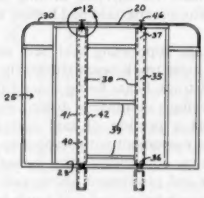
**Division of Ser. No. 224,663, Feb. 9, 1972. This application Nov. 12, 1973, Ser. No. 414,797**

**Int. Cl. B60p** *1/00*

**U.S. Cl. 214—85** **1 Claim**

**1.** In a combined cage for transporting live poultry and a vehicle for transferring the same comprising, a cage having a pair of oppositely opposed side wall members, a pair of oppositely opposed end wall members, a pair of oppositely opposed

upper and lower wall members, means for attaching said wall member pairs to one another to form a generally rectangular structure, a plurality of partition members extending from and between the said side and end wall members, and arranged parallel to said upper and lower wall members thereby dividing the volume enclosed by said pairs of wall members into a plurality of compartments, a dividing means arranged perpendicularly to said partition members, extending from and between said side wall members and upper and lower wall members, and being arranged intermediate between said end wall members to divide a plurality of compartments into approximate halves lengthwise, access means to each of said plural compartments and arranged in each of the end wall members of said structure, each access means including a door pivotally depending from said cage and adapted to pivot inwardly of its respective compartment to provide ingress into said compartment, the side edges of each door being disposed for contact with the inner edge of the adjacent end wall to prevent said door from pivoting and opening outwardly, a plurality of casters mounted to the lower wall member, each of said side wall members, upper and lower wall members, partition members, dividing means, and access doors comprising a skeleton structure covered with wire mesh, and the arrangement of the pivotal doors provided in each end wall member of a cage facilitating the compact side-by-side placement of a plurality of cages as during usage, said vehicle including a flat bed



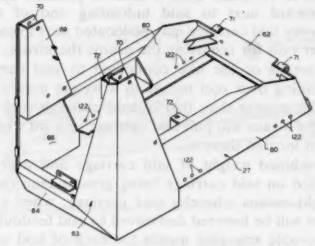

structure having at least one access opening thereto, an axle and wheel structure mounted to the underside of said flat bed structure, vehicle skeleton structure mounted upon said bed and delimiting an enclosed area capable of sustaining a plurality of said cages in both adjacent and tandem relationship, ramp means pivotally mounted to the back end of said flat bed structure and providing the instrumentality for loading and removal of said plurality of cages, said ramp means having a first and second position, said first position being designed for loading said vehicle, and said second position being designed such that said ramp becomes a back for the side vehicle skeleton structure for closing of the vehicle, said ramp means comprising first and second channel shaped track parts and support beams between said track parts, said track parts being spaced apart a distance by said support beams to accommodate the movement of the castered cage upon the ramp means, one end of each first and second track parts being hingedly mounted to the back end of said flat bed structure, the other end of said track parts being tabbed, corresponding tabs provided upon the back of the vehicle skeleton structure and being in alignment with the track tabs as when the tracks are pivoted into closure with the back of the said structure, and locking pins cooperating between the tabbed ends of the track parts and the aligned tabs of the vehicle skeleton structure to secure said pair of track parts into the position of function as the back for the flat bed structure for securely retaining the loaded cages upon the vehicle during its transit.

**3,895,728**

## TRACTOR VEHICLE HAVING MATERIAL HANDLING SUBFRAME

**John P. Heggen, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.**

**Filed Feb. 5, 1973, Ser. No. 329,939**
**Int. Cl. B66f 11/02**
**U.S. Cl. 214—140** **13 Claims**



1. A tractor vehicle and material handling subframe, in combination, comprising a tractor body defined in part by side walls on opposite sides of the tractor centerline, by end walls at opposite ends of the side walls and by a bottom wall all partially enclosing a compartment area, an engine, hydraulic drive means powered by said engine contained within said compartment, a plurality of spaced stub axles projecting from the side walls on opposite sides of said compartment, wheels driven by said hydraulic drive means rotatably mounted on said stub axles, a subframe mounted on said tractor body comprising laterally spaced, longitudinally extending side beams, support means mounted on said stub axles, said side beams secured to said stub axles on said support means and defining an interior space for receiving said tractor body, upright members projecting upwardly from adjacent the rear of each side beams on each side of said engine and providing at the upper ends thereof a pair of pivotal mountings, a pair of lift arms pivotally attached at said pivotal mountings and extending forwardly along each side and downwardly at the front in the lowered position mounting a material handling means whereby material handling loads are contained predominately in said subframe and transferred to said stub axles directly.

7. A skid steered loader comprising in combination separate tractor and loader subframe assemblies, said tractor assembly including a body defined in part by side walls on opposite sides of the loader center line and by end walls at opposite ends of the side walls and a bottom wall enclosing at least partially a lower compartment area having a length less than the distance between wheels on opposite sides of the loader, additional side and end walls spaced from said first mentioned side and end walls defining a smaller upper compartment area medially of said tractor body so as to provide an engine space at the rear thereof and a space for the operator's legs at the front, a pluarlity of stub axles projecting from the sides of the lower compartment area and spaced apart less than the width across between the wheels, a support mounting on each stub axle said loader subframe assembly comprising a pair of laterally spaced, longitudinally extending side beams generally defining therebetween a space longer than it is wide to receive and partially surround said tractor body and secured to said support mountings on the stub axles, a pair of upright members joined at the bottom by a cross member, said upright members being formed of metal plate elements wider at the bottom than at the top so as to protectively enclose a portion of said engine space, a shoulder plate secured inwardly of and spaced from said upright plate and generally conforming to the configuration of the upper portion thereof providing a pivotal mounting location at the upper end thereof between said shoulder and upright plates, a pair of lifting arms, one connected between

each upright and shoulder plate at the pivotal mounting location and extending forwardly and downwardly therefrom alongside the operator's space and supported in the lowermost position on the front portion of the subframe and said arms extending downwardly immediately at the front of said loader and mounting a material handling member on the ends thereof whereby said upright members and side beams protectively surround the tractor and loader forces are contained and transferred to the stub axles directly.

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**3,895,729**

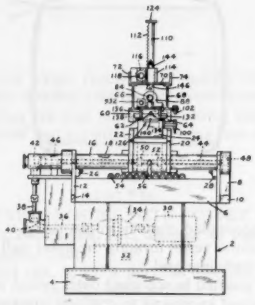
## SENSOR RESPONSIVE CYBERNETICS MACHINE

**William J. Dukette, Palisades Park, N.J., assignor to American Associated Cybernetics, Inc., New York, N.Y.**

**Division of Ser. No. 74,784, Sept. 23, 1970, Pat. No. 3,770,140, which is a continuation-in-part of Ser. No. 65,560, Aug. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 861,015, Sept. 25, 1969, abandoned. This application July 2, 1973, Ser. No. 375,637**

**Int. Cl. B25j** *9/00*

**U.S. Cl. 214—152** **6 Claims**



1. In an automatic article manipulator which includes an article engaging head movably mounted on a frame and an article responsive sensor mounted on said head, the method of searching for and locating a randomly positioned article which comprises the steps of:

a. moving said article engaging head;

b. sensing for the presence and location of an article while said head is moving; and

c. stopping the movement of said head when the presence and location of an article is detected.

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**3,895,730**

## SAFETY CONTAINER

**Anthony J. Koehne, Severna Park, and Harry O. Baughan, III, Baltimore, both of Md., assignors to Poly-Seal Corporation, Baltimore County, Md.**

**Filed Mar. 18, 1974, Ser. No. 451,863**

**Int. Cl.² B65D** *55/02*

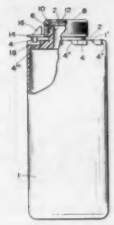
**U.S. Cl. 215—216** **1 Claim**

1. A container and safety closure therefor, including in combination:

a. a hollow container having an externally threaded tubular neck integrally molded thereon having its tubular opening extending into the hollow container, the area of the container extending outwardly from the neck being in a plane angularly disposed to the elongated axis of the neck, the outer surface of the container adjacent the neck having a plurality of recesses extending inwardly from the outer upper surface of the container and equidistant from the neck;

b. an internal threaded closure cap adapted to screw on to and off the externally threaded neck;

c. said closure having a flexible tab formed integral with the lower edge of the cap and extending outwardly from one side thereof and parallel with the outer surface of the container adjacent the neck to a point overlying the recesses and out of engagement therewith, a pawl formed integrally with the under surface of the flexible tab and positioned on the tab to engage the recesses in the container when the closure is threadably moved downwardly on the neck;



d. a stop member integrally formed on the tab and spaced outwardly from the closure cap, said stop extending upwardly from the upper surface of the tab at a point to engage the closure cap after the tab has been flexed to a point to disengage the pawl from the said recess in order to rotate the closure cap in its off direction.

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**3,895,731**

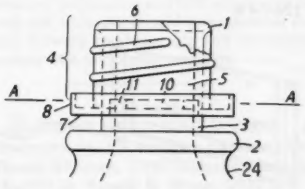
## CLOSURE FOR RECEPTACLES

**Henri Coursaut, Mercurey, France, assignor to Le Bouchage Mecanique, France**

**Filed July 9, 1973, Ser. No. 377,313**

**Int. Cl. B65d** *55/02, 85/56;* **A61j** *1/00*

**U.S. Cl. 215—218** **4 Claims**

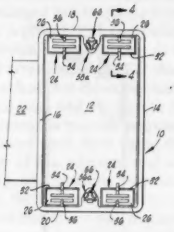



1. Two-part closure means for a receptacle, said closure means comprising an annular member having a substantially cylindrical portion with a thread in the external surface thereof and a flange extending radially from one end thereof, said flange having formed therein a circumferential channel extending over less than a full circle to define over the remainder of the circle an arcuate protuberance, the cylindrical portion being apertured about said protuberance, whereby upon deformation of the flange adjacent the protuberance the protuberance may be displaced axially of the cylindrical portion, said closure means further comprising a cap having an internal thread and having a void formed therein engageable over said protuberance upon engagement of said annular member and cap at their threads.

## 3,895,732
## ELECTRICAL JUNCTION AND SWITCH BOXES

**Richard L. Robinson, Bryant, and Ivan L. Volgyesy, Camanche, both of Iowa, assignors to Indian Head, Inc., New York, N.Y.**

**Filed Feb. 1, 1974, Ser. No. 438,686**
**Int. Cl. H02g *3/14***
**U.S. Cl. 220—3.5** **17 Claims**

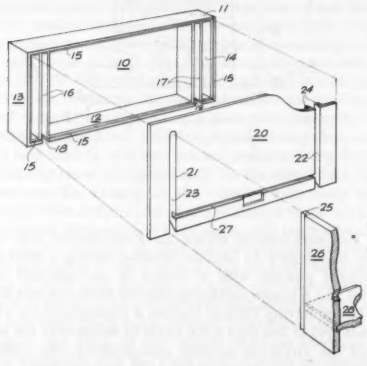


1. A molded synthetic resin electrical service box comprising:
- at least two walls intersecting each other at substantially a right angle; and
- a break-out window extending between said intersecting walls at an acute angle to each of said intersecting walls, said break-out window comprising:
- a removable panel in a surrounding opening spacing the panel from the remainder of the box;
- a pair of bridge webs bridging across said opening and connecting opposite sides of the panel with said two intersecting walls; and
- a pair of guide ribs on the side of said removable panel facing the inside of said box and defining a tool receiving space therebetween.

## 3,895,733
## MOLDED TWO-PART DRAWER FRONT

**Herbert R. Chambers, 1358 Vicksburg Dr., Southaven, Miss. 38671, assignor to Spencer Industries, Inc., Youngstown, Ohio**

**Continuation of Ser. No. 198,231, Nov. 11, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 348,958**
**Int. Cl. A17b *88/00***
**U.S. Cl. 220—4 R** **10 Claims**

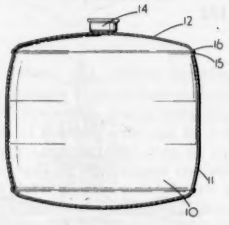


1. A drawer front made of two plastic pieces for assembly to drawer sides having dove-tailed end portions, said drawer front consisting of a separately molded exterior piece and a separately molded inner piece arranged to be attached to one another, said inner piece having narrow vertical apertures formed therein with the walls of said inner piece defining said apertures being oppositely inclined with respect to one another so as to form open bottom dove-tailed configurations for the reception of the dove-tailed end portions of said drawer sides, ribs formed on said inner piece alongside said narrow apertures for increasing the thickness of said inner piece adjacent said apertures and increasing the depth of said apertures.

## 3,895,734
## THIN-WALLED CONTAINERS

**Lindsay Maitland Thomas, Chisworth near Stockport, England, assignor to Fairey Stainless Limited, Heston, England**

**Division of Ser. No. 204,250, Dec. 2, 1971, Pat. No. 3,729,812. This application Mar. 19, 1973, Ser. No. 342,905**
**Claims priority, application United Kingdom, Dec. 2, 1970, 57247/70**
**Int. Cl. B65d *7/02***
**U.S. Cl. 220—5 R** **9 Claims**



1. A double walled container comprising:
- a. a rigid outer vessel forming the outer wall of said double walled container and
- b. a liner inserted in said rigid outer vessel, said liner being constructed to expand to conform substantially with the inner surface of said outer vessel using fluid pressure, said liner comprising
  - i. an open-ended, thin-walled tube of stainless steel the end portions of which are bent outwardly to form circumferential flanges projecting substantially at right angles to the wall of the tube, the junction of each flange and the wall of the tube being smoothly curved, and
  - ii. two thin end plates made of stainless steel and of size and shape to span the open ends of the tube, one of the end plates being welded to each of the flanges on the tube along the overlapping portion, close to the radially outer edges of the flanges and of the end plates,

the shape of the weld between the tube and the end plates constituting means responsive to fluid pressure for stretching the welding seams between the tube and the end plates to effect weld seams which are substantially flat internally.

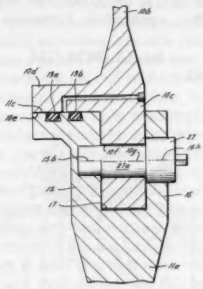
## 3,895,735
## VESSEL WITH PRE-COMPRESSED SEAL

**Henry J. Clay, Houston, Tex., assignor to Hahn & Clay, Tex.**

**Filed July 8, 1974, Ser. No. 486,305**
**Int. Cl. B65d *7/02***
**U.S. Cl. 220—5 A** **8 Claims**

1. A new and improved vessel structure, including:
- a first vessel section having an annular end portion formed of inner and outer, concentric connector rings separated to form an annular recess;
- a second vessel section having an annular end portion including a connector ring for insertion into said annular recess of said first vessel section;
- seal means mounted with said annular end portions of said first and second vessel sections for sealing said first and

second vessel sections against the passage of fluid therebetween; and



said connector rings receiving a radially directed pin mounted for rotation with respect to said connector rings and including pre-load means for locking said connector rings together and for pre-compressing said seal means.

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3,895,736

## PRESS TYPE CLOSURE WITH DOUBLE SEAL

James B. Swett, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Oct. 9, 1973, Ser. No. 404,455
Int. Cl. B65d *41/00*
U.S. Cl. 220—306 1 Claim

1. A locally distortable plastic closure contractably and distensibly constructed and having an elasticity such that it is adapted to hermetically seal an open-mouthed member and comprising:

a. a center main wall including a corrugated area emanating from a center portion thereof toward a peripherally extending wall, said center main wall being adapted for the application of pressure to the approximate center thereof in such manner that said corrugated area tends to collapse upon itself and substantially uniformly displace said peripherally extending wall until said closure is easily positionable on an open-mouthed member; and,

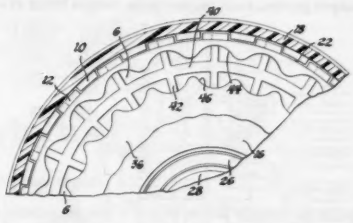
b. first and second integral extended sealing beads positioned around said peripherally extending wall, said sealing beads being displaceable in like manner with said peripherally extending wall such that at least a portion of said sealing means is closely engageable with and sealable against the walls of an open-mouthed member due to the resiliency and elasticity of said closure upon the discontinuance of applied pressure to said center main wall and wherein said secondary annular sealing bead is angularly disposed with respect to the horizontal, is of a more narrow cross-sectional configuration than the first sealing bead and is positioned above the first such bead.

3,895,737

## CHILD-PROOF DISPENSING CONTAINER AND COVER ASSEMBLY

Otto Phillips, London, Canada, assignor to International Tools (1973) Ltd., Windsor, Canada

Filed Mar. 7, 1974, Ser. No. 449,121
Int. Cl. B65d *83/04*; G07f *11/00*
U.S. Cl. 221—82 3 Claims



1. A child-proof container and cover assembly for pills and the like comprising: a container member having a base with concentric inner and outer side walls projecting axially therefrom; a cover member rotatably mounted on said container member; a dispensing opening in said cover member sequentially movable to positions in which a pill can be removed from the container member through said dispensing opening; said cover member having an end wall with a skirt projecting axially therefrom; said skirt and outer side wall being disposed in telescopic relationship with respect to each other; locking means on said container and cover members having a locked position in which said cover member is locked against rotation with respect to said container member and an unlocked position in which said cover member can rotate with respect to said container member; said locking means being movable between said locked and unlocked positions by axial movement of said cover member with respect to said container member; and resilient biasing means formed integrally on said container member; a retaining post projecting axially from said base; a pair of arcuate slots formed in said base between said inner side wall and retaining post; a pair of strips extending diametrically between said retaining post and inner side wall and separating said arcuate slots; said biasing means comprising a spring member in each of said arcuate slots; each of said spring members having an inner end joined integrally to said inner side wall and projecting therefrom toward said retaining post and terminating in a free end spaced from said retaining post; and a plunger on said cover member projecting into the space between said inner side wall and retaining post into engagement with said spring members.

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3,895,738

## GASOLINE DISPENSING SYSTEM

George E. Buchanan, 6613 N. Prospect, Oklahoma City, Okla. 73111; Donald R. Krone, 10505 Ridgeview Dr., Oklahoma City, Okla. 73120; Russell R. Krone, 2908 N.W. 28 St., Oklahoma City, Okla. 73107, and James E. Noyes, 5817 N.W. 72 St., Oklahoma City, Okla. 73132

Filed Sept. 20, 1973, Ser. No. 398,841
Int. Cl. G06f *15/56*; B67d *5/08*
U.S. Cl. 222—26 15 Claims

1. A gasoline dispensing system for delivery of gasoline from one or more supply reservoirs comprising:

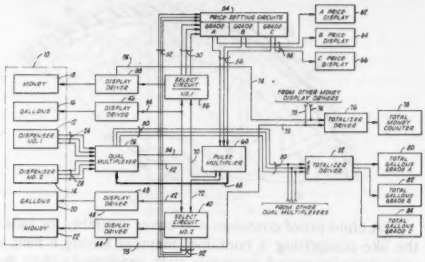
plural dispensing means, each including metering means, for actuation to dispense gasoline from selected ones of plural supply reservoirs;

plural circuit means each generating an electrical pulse output as a predetermined rate in proportion to the amount of gasoline flow dispensed through a respective one of said plural dispensing means;

multiplexing means receiving electrical pulse outputs from each of said plural circuit means to provide plural, time sequential pulse output groups;

scanning means including a clock oscillator for controlling scanning rate of said multiplexing means such that a sequential pulse output group may be generated for each of the respective plural dispensing means;

rate multiplier means including counting circuitry which is controlled by said scanning means to receive input of said sequential pulse output groups and to generate a sequential money pulse output for each of the respective pulse output groups, each money pulse output being at a prese-



lected pulse rate in proportion to total pulses of the respective pulse group;

plural input means controlled by said scanning means to provide sequential binary coded decimal inputs to said counting circuitry to preselect the proportional rate of each money pulse output; and

plural means indicating each of said pulse output groups as gallons dispensed and indicating each of said money pulse outputs.

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**3,895,739**

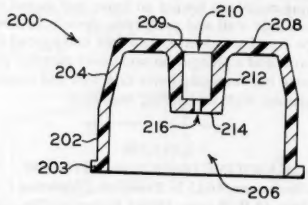
**DISPENSER FOR FLUSH TANK**

**Dean H. Buchtel, Canton, Ohio, assignor to NuCon, Inc., North Canton, Ohio**

**Continuation-in-part of Ser. No. 202,905, Nov. 29, 1971, Pat. No. 3,784,058. This application Aug. 23, 1973, Ser. No. 390,865**

**Int. Cl. E03d** *9/03*

**U.S. Cl. 222—57** **8 Claims**




**1.** Apparatus for containing and regulating the dispensing of fluids, comprising:

a container for the fluid, the container having an opening at its lowermost point;

a nozzle member received in sealing engagement with the opening, the nozzle member defining an open bottomed chamber and having a recess depending from the top thereof into the chamber, the recess having an orifice therein in communication between the chamber and the interior of the container; and

insert means received within the recess and defining therewith an elongated spiral passageway extending upwardly from the orifice to a point adjacent an upper end of the nozzle, wherein the insert is positionally movable within the recess, the degree of insertion of the insert in the recess regulating the flow-restrictive characteristics of the passageway.

**3,895,740**

**APPARATUS FOR DELIVERING PART QUANTITIES OF FOAM STOCK**

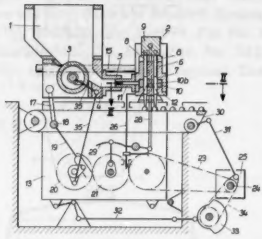
**Ralph van der Buylton-Domgraff, Blucherstrasse 23, 3167 Burgdorf, Germany, and Alfred Doderer-Winkler, Tannenweg 22, 5451 Melsbach, Germany**

**Filed Oct. 2, 1973, Ser. No. 402,712**

**Claims priority, application Germany, Oct. 2, 1972, 2248235**

**Int. Cl. B67d** *5/52*

**U.S. Cl. 222—162** **4 Claims**



**1.** Apparatus for delivering part quantities of foam stock and the like, comprising a stock container having an open delivery end; a transfer molding device; guide rods carried by said device and engaging said stock container; whereby said stock container is reciprocable relatively to said device; and a rotary feed roller carried by said stock container and extending into said delivery end; said device including a nozzle carried by said container and enclosing said delivery end, a hollow plunger strip slidably supported in said nozzle and having spaced parallel cylindrical bores, a plurality of delivery chambers adapted to communicate with said bores and further having a valve spool movable transversely to said bores and having ducts and parts extending transversely thereto and adapted to communicate with said bores, delivery plungers slidably mounted in said delivery chambers and a die plate carried by said device below said valve spool for the delivery of the foam stock.

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**3,895,741**

**INTRAVENOUS FLUIDS ADMINISTRATION APPARATUS**

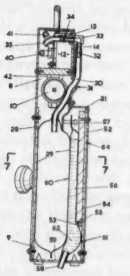
**Bede Stanislaus Nugent, Artarmon, Australia, assignor to Bestnu Engineering Pty. Limited, Artarmon, Australia**

**Filed Sept. 27, 1972, Ser. No. 292,693**

**Claims priority, application Australia, Sept. 28, 1971, 6452/71**

**Int. Cl. B65d** *35/28*

**U.S. Cl. 222—103** **5 Claims**



**1.** Apparatus for parenteral fluid administration to a patient comprising:

a. two pressure pads having mutually confronting spaced apart pressure applying faces, a side edge and bottom edge of one face being offset from the corresponding side edge and bottom edge of the other face;
b. a pliant bag having a bottom outlet, a gaseous content and a liquid content;
c. means to support said pliant bag sandwiched between said faces so that its liquid content may drain through said outlet, the outlet extending beneath one of said pads;
d. loading means operable to cause one of said pressure pads to approach the face of said other pressure pad;
e. said faces being so sized that when, by said approach, they bring opposed side-walls of said pliant bag therebetween into contact thereby to halt further said approach of said faces, portions of said side-walls remain bulged apart sufficiently for the squeezed bag still to contain said gaseous content thereby to avoid its reaching the patient; and said pressure-applying faces being formed that the said bulged apart side-wall portions form a lateral duct in and at the bottom of the bag to which said outlet opens, and also forms at least one riser duct which opens to said lateral duct and extends for the full height of the bag interior.

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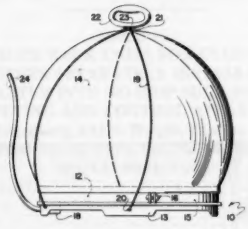
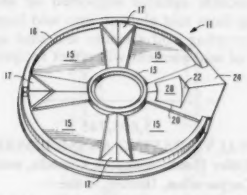
**3,895,742**
**COLLAPSIBLE CONTAINER**
**Herman Wulbern, Winnipeg, Canada, assignor to Melet Plastics Ltd., Winnipeg, Canada**
**Filed Nov. 19, 1973, Ser. No. 417,277**
**Int. Cl. B65d** *37/00*
**U.S. Cl. 222—105** **2 Claims**



1. A collapsable container comprising in combination a base which is substantially circular when viewed in plan, an elastic membrane secured around the periphery of said base to form a closed container with said base, inlet and outlet means in said base communicating with the interior of said container, a plurality of straps secured by one end thereof around the perimeter of said base, a common carrying handle secured to the other end of said straps, said straps enclosing said membrane when full whereby the load of said container is supported by said carrying handle when said container is being carried, said base including a base panel and a peripheral wall around said panel, said membrane being substantially semi-spherical when full and being secured by the open end thereof around said wall, support surface engaging portions depending from adjacent the periphery of said base panel, a flexible steel strap secured around the base of said membrane and said peripheral wall in clamping relationship, said flexible carrying straps secured equidistantly around said base and extending upwardly and over said membrane to meet at a common apex, said handle being secured to said common apex, said membrane, said straps and said handle nesting within said peripheral wall when said container is empty.

**3,895,743**
**POUR SPOUT LID**
**Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.**
**Filed Dec. 8, 1972, Ser. No. 313,220**
**Int. Cl. B65d** *51/16*
**U.S. Cl. 222—143** **8 Claims**



1. A closure having a rim structure adapted to engage the top of a container comprising:
a central ring portion;
a plurality of rib sections extending radially from said ring portion to said rim structure with at least a part of some of said rib sections including a surface for supporting a container; and,
a raised portion extending radially outwardly from said ring to a point above the rim structure, said portion presenting an outwardly flared upwardly directed elongated crest to guide the flow of materials from said container said elongated crest and said container top thereby forming the spout opening.

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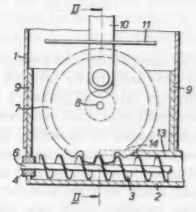
**3,895,744**
**CONVEYORS**
**Leslie George Powning, Stockport, England, assignor to Sturtevant Engineering Co., Limited, Finchley, England**
**Continuation of Ser. No. 144,860, May 19, 1971, abandoned.**
**This application Jan. 18, 1974, Ser. No. 434,644**
**Int. Cl. G01f** *13/00*
**U.S. Cl. 222—231** **4 Claims**



1. A screw conveyor unit for use with a hopper having an outlet opening, said unit comprising:
a. a hollow carrier removably receivable by the hopper outlet opening and communicating with the hopper;
b. a conduit supported by said carrier, said conduit having at one end thereof an inlet disposed within said carrier for communicating with the interior of said carrier, said conduit having a wall and a slot formed in said wall within said carrier, said slot also providing communication between said carrier and said conduit, said slot extending in the direction of said conduit axis and being located downstream of said inlet in the conveying direction; and said conduit having an outlet at its other end for delivering material to be discharged from said hopper;
c. a worm conveyor screw having a spindle extending from said inlet to said outlet and having a helical screw flight defining with said conduit a helical passage from material to be conveyed;

d. drive means for said conveyor screw;

e. a generally planar toothed element rotatably mounted in said carrier by bearing means, said element being mounted with a portion thereof extending through said slot in said conduit with the teeth thereof meshing with said flight of said conveyor screw to form a barrier across said helical passage;

f. a reciprocable agitator supported on said carrier and extending from said element into said hopper; and

g. means coupling said element and said agitator so that rotation of said element will effect reciprocation of said agitator.

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**3,895,745**

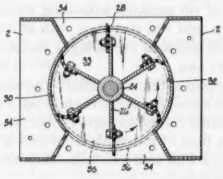
## ROTARY VALVE HAVING AN IMPROVED AIR SEAL

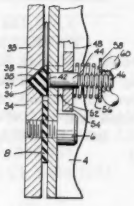
**Cecil Hugh Ridler Hook, Asbestos, Canada, assignor to Johns-Manville Corporation, Denver, Colo.**

**Filed Feb. 25, 1974, Ser. No. 445,181**

**Int. Cl. G01f** *11/10*

**U.S. Cl. 222—368** **12 Claims**





1. A rotary valve comprising end plates, a body section, a rotatable shaft running lengthwise through said body section and extending through said end plates, a plurality of vanes extending outward from said shaft, said vanes having wipers along their terminal edges to maintain seals between said vanes and said body section, side plates surrounding said shaft and lying parallel to said end plates, said side plates adapted to rotate with said shaft, and an annular gasket forming a sealing relationship between each side plate and the body section the improvement comprising said annular seal at each side plate being formed by a wear resistant gasket pressed against at least one annular beveled sealing surface on each of said side plates and against a sealing surface on the body section opposite said beveled surface by adjustable pressurizing means.

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**3,895,746**

## POSITIVE EXPULSION TANK

**William H. Bauer, Grand Island, N.Y., assignor to Textron Inc., Providence, R.I.**

**Continuation-in-part of Ser. No. 571,938, Aug. 11, 1966, Pat. No. 3,494,513. This application Aug. 6, 1969, Ser. No. 866,049The portion of the term of this patent subsequent to Feb. 10, 1987, has been disclaimed.**

**Int. Cl. B67d** *5/42*

**U.S. Cl. 222—386.5** **3 Claims**

1. An expulsion tank assembly comprising, in combination, a cylindrical container having a portion closed at one end wall and having a storage space therein for a usable fluid to be expelled therefrom,

a telescoped ductile metal bladder defining one end of said storage space and adapted to be extended thereinto to conform closely with the inner surfaces of said container thereby to displace the usable fluid therefrom with high volumetric efficiency, said bladder when extended being of cylindrical form having a cylindrical side wall open at one end and closed at its other end by a head wall portion, said bladder being sealingly secured peripherally around its open end to said container and said side wall of the bladder being initially disposed to present a series of telescoped annular bands, the bands being disposed in close proximity to each other so that the bands successively lead into each other along annular folds of small radius facing alternately toward and away from said storage space and with the innermost band being joined directly to said head wall portion of the bladder, said small radius being set so as not to exceed the ultimate plastic strain capability of the bladder material during expulsion,

means for introducing pressurizing fluid against that side of said bladder facing away from said storage space and at a pressure sufficient to unroll said side wall along those folds facing said storage space to extend said bladder as aforesaid, whereby alternate bands are subjected to axial tension and hoop tension while the remaining bands are subjected to axial compression and hoop compression due respectively in each case to the resistance of the metal to unrolling and the radial pressure of said pressurizing fluid,

each of said bands subjected to axial and hoop tension initially overlapping a next outermost band at least along a length thereof which would not expose a length of such next outermost band therebeyond which is greater than

$$\frac{.56E}{P}\sqrt{Ri}\left(\frac{t^2}{R}\right)+.657\sqrt{Ri},$$

where R is the radius of the band in question, E is the modulus of elasticity, $t$ is the material thickness, and P is the required rolling pressure,

means for stabilizing said innermost band during extension of the bladder whereby the bladder may attain its fully extended state

the fold line leading from said innermost band to the next outermost band facing away from said storage space whereby said means for stabilizing is constituted by the rigidity of said innermost band as effected by the axial and hoop tension forces acting thereon; and

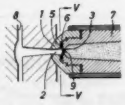
each of said bands subjected to compressive forces having a portion thereof exposed on said storage space side beyond the next innermost tensioned band.

3,895,747

## RESIN FLOW CONTROLLING DEVICE FOR INJECTION MOLDING MACHINE

Katashi Aoki, Sakaki, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Sakaki, Japan

Filed Oct. 4, 1973, Ser. No. 403,357
Claims priority, application Japan, Oct. 6, 1972, 47-100379
Int. Cl.[2] B29F 1/06
U.S. Cl. 222—494 6 Claims



1. A resin flow controlling device for an injection molding machine which comprises an orifice formed near the outlet of a molten resin passage; gap means formed between said outlet and said orifice; a valve plate positioned within said gap; said valve plate comprising a spring plate having a bent closing portion and defining with said gap openings for resin passage, said closing portion normally contacting said orifice and being deformable to an out of contact position by pressure of molten resin at said orifice to open said orifice, wherein said gap means further comprises a supporting member defining an opening for resin passage between said valve plate and said outlet, said supporting member adapted to maintain said closing portion of said spring plate in said out of contact position.

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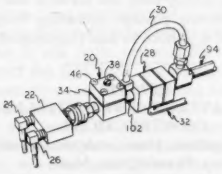
3,895,748

## NO DRIP SUCK BACK UNITS FOR GLUE OR OTHER LIQUIDS EITHER SEPARATELY INSTALLED WITH OR INCORPORATED INTO NO DRIP SUCK BACK LIQUID APPLYING AND CONTROL APPARATUS

George R. Klingenberg, 615 S. Wright, Tacoma, Wash. 98408

Filed Apr. 3, 1974, Ser. No. 457,447
Int. Cl.[2] B05B 1/28
U.S. Cl. 222—571 20 Claims



1. A no drip suck back unit for glue and other liquids to completely avoid any dripping after the stopping of the glue or other liquid being supplied through a discharge opening, comprising:

a. a body;

b. an interior chamber in the body;

c. a liquid passageway continuing through the body entering and leaving the interior chamber;

d. an air passageway entering the body and terminating in the interior chamber; and

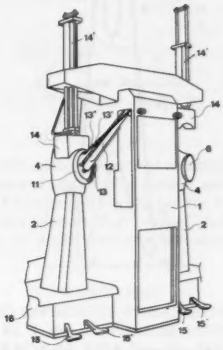
e. a diaphragm flexible from its mid position in the interior chamber to move one way to decrease the liquid volume of the chamber and to move the opposite way to decrease the air volume of the chamber, the latter movement creating a vacuum volume to suck back liquid increasing the overall liquid volume of the interior chamber.

3,895,749

## IRONING MACHINE FOR IRONING SHOULDERS

Giovanni Cartabbia, Via Predore 10, 24067 Sarnico, Italy

Filed July 19, 1974, Ser. No. 490,217
Claims priority, application Italy, Aug. 3, 1973, 27529/73
Int. Cl.[2] D06C 15/00
U.S. Cl. 223—57 10 Claims



1. An ironing machine for ironing the sleeves of jackets, overcoats or similar garments, comprising an upright central support structure; two halves of a garment form respectively arranged to opposite sides and symmetrically with respect to said central support structure for supporting the shoulders of a jacket or the like; a pair of extension members of substantially oval cross section for said halves, each having an upper portion fixed to the respective half and a downwardly extending portion separated from the respective half by a cutout, said downwardly extending portion adapted to extend into a respective sleeve of the jacket; a pad located in each cutout; means fixed to said pad for reciprocating the same in substantially horizontal direction; a pair of substantially vertical plates located outwardly of said downwardly extending portions, respectively; and means supporting said plates for oscillating motion about an axis between a first position and a second position substantially aligned in horizontal direction with said pad and for reciprocating movement along said axis.

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3,895,750

## TIE TREE

Joseph J. Fegan, Jamesburg, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Dec. 27, 1974, Ser. No. 536,800
Int. Cl.[2] D06C 15/00
U.S. Cl. 223—65 6 Claims

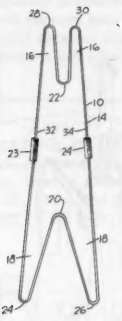
1. A device for restoring a tie to its proper shape comprising:

a. a flexible wire top section of an M-shaped configuration, with the sides of said M-at a given angle,

b. a flexible wire bottom section of an inverted M-shaped configuration and being relatively larger than said top section, with the arms of said M directed relatively along the same angle as said sides of said top section,

c. means coupling said arms of said top and bottom sections to form a composite frame member having an intermediate section adapted to conform to the shape of any one of a plurality of ties accommodated by said frame to press on the sides of said tie when accommodated by moving the central portions of either of said top and bottom section M's towards or away from said intermediate sec-

tion of said composite member, with the M of said bottom section being always maintained outside the confines of



any tie being accommodated, while the M of said top section is within said confines of said tie.

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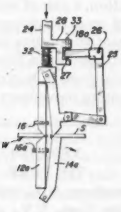
**3,895,751**

## METHOD AND APPARATUS FOR TEARING SECTIONS FROM A WEB

**Robert Carl Shepherd, Oak Lawn, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.**

**Filed July 9, 1973, Ser. No. 377,372**
**Int. Cl. B26f** *3/00*
**U.S. Cl. 225—3** **11 Claims**



1. A method for successively tearing a continuous fibrous web into sections having a leading edge and a trailing edge comprising the steps of providing a web; providing two juxtaposed pairs of opposing holding means; feeding said web between said pairs of holding means; moving said pairs of holding means into transverse holding engagement with said web; displacing one pair of said holding means relative to the other pair of holding means and in the direction of web movement during said engagement to tear the web and separate a section therefrom without causing a rearward force against the leading edge of the next successive section; and moving the torn section away from said web together with the displaced pair of holding means while the web is held by the other pair of holding means.

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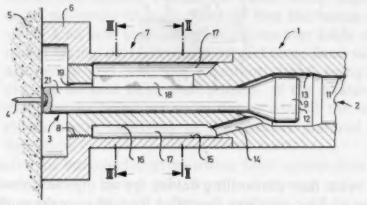
**3,895,752**

## EXPLOSIVE POWDER DRIVEN SETTING GUN WITH SILENCING DEVICE

**Shigefumi Hatayama, Futtsu, and Masao Tsunekawa, Sooka, both of Japan, assignors to Hilti Aktiengesellschaft, Liechtenstein**

**Filed Apr. 30, 1973, Ser. No. 355,666**
**Claims priority, application Germany, May 2, 1972, 2221374**
**Int. Cl. B25c** *1/14*
**U.S. Cl. 227—10** **7 Claims**



1. An explosive power driven setting gun for driving anchoring members, such as bolts, studs, nails and the like, into a target material, comprising an axially elongated barrel forming a bore and having a forward muzzle end and an oppositely disposed rearward end, a sleeve extending in the axial direction of said barrel and secured to and laterally enclosing said barrel for a portion of its axial length forwardly of the rearward end of its bore, an axially extending portion of the outer surface of said barrel disposed in spaced relationship to the inner surface of said sleeve and forming therebetween an axially extending ring-shaped slot about said barrel radially outwardly from said bore, at least one connecting passage extending through said barrel between the bore therein and said ring-shaped slot, at least one gas outlet passage located in said barrel radially inwardly of said ring-shaped slot and communicating between said ring-shaped slot and the bore in said barrel, said gas outlet passage located closer to the forward end of said bore than said connecting passage, said bore having a larger diameter adjacent the rearward end of said barrel than the portion of said bore which extends rearwardly from said forward end toward said rearward end, said ring-shaped slot located laterally about the smaller diameter end of said bore extending rearwardly from the forward end of said barrel, and said connecting passage extending from the larger diameter portion of said bore to said ring-shaped slot.

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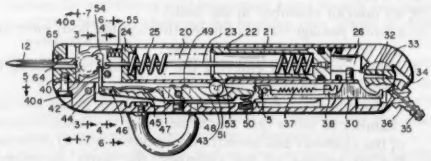
**3,895,753**

## FASTENER ATTACHMENT SYSTEM NEEDLE CONSTRUCTIONS

**Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.**

**Continuation of Ser. No. 158,438, June 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 39,564, April 17, 1970, Pat. No. 3,659,769. This application July 26, 1973, Ser. No. 382,963**
**Int. Cl.[2] B65C** *7/00*
**U.S. Cl. 227—67** **25 Claims**



1. A needle comprising a tip, a central portion and a mounting portion, a first slot and a bore extending from the rear of

the mounting portion into the central portion, a second slot in the mounting portion offset from the first slot and which extends from the rear of the mounting portion partially to the front portion of the mounting portion closest to the central portion, and a knife provided in the mounting portion opposite the first slot and offset from the second slot, said knife comprising cutting edge portions shaped to form a 'V' with the bottom of the 'V' pointing towards the tip and cutting edge portions spaced apart at the rear of the mounting portion, and the bottom of the 'V' extending partially towards said central portion less than the distance said second slot extends towards said central portion.

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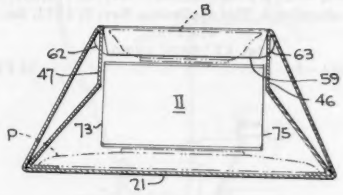
**3,895,754**

## TAPERED CARTON ASSEMBLY CONTAINING FILLER CARTON

**Charles W. Rosenburg, Jr., North Tonawanda, N.Y., assignor to F. N. Burt Company, Inc., Buffalo, N.Y.**

**Filed Aug. 16, 1974, Ser. No. 498,131**
**Int. Cl.² B65D** *5/36, 5/00*
**U.S. Cl. 229—23 R** **9 Claims**




1. A carton assembly including a tapered carton containing a filler carton, said tapered carton comprising a polygonal bottom wall, an outer side wall connected to said bottom wall along each marginal edge thereof, opposite side edges of each said side wall converging from said bottom wall to the free edge thereof so as to form a truncated pyramidal carton when erected with adjacent side wall edges coinciding, an inner wall connected along the free edge of an opposing pair of said side walls and being secured to said bottom wall, each said inner wall including a rectangular section at said connected edge, each said section lying perpendicular to said bottom wall, each of the remaining side walls being removably connected to said opposing pair of side walls, and said filler carton comprising interconnected flat side walls, the width of said filler carton being substantially equal to the spacing between said rectangular sections, a bottom panel connected along an edge of one of said flat side walls, projections extending outwardly of opposite ends of said bottom panel along the length of said filler carton, whereby said filler carton is prevented from shifting within said tapered carton in directions parallel to said bottom wall.

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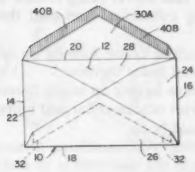
**3,895,755**

## TAMPER PROOF ENVELOPE

**Carol S. McCarthy, Annapolis, Md., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest**

**Filed Feb. 27, 1974, Ser. No. 446,283**
**Int. Cl.² B65D** *27/30*
**U.S. Cl. 229—83** **1 Claim**

1. A tamper proof envelope, which comprises:
a. a main body face wall having a left, a right, a front and a rear edge;
b. a left, a right, and a bottom flap portion integrally formed to said main body face, said left and said right flap portions folded under and sealed to said bottom flap portion forming an envelope pocket;
c. a top flap portion having a marginal edge, said top flap portion integrally formed to said main body face; and
d. an integral mixture of a heat sensitive dye and an adhesive material which becomes adhesive on application of




moisture, said mixture deposited as a single layer on said marginal edge of said top flap portion, said mixture forming a bond between said top flap portion and said left, said right and said bottom flap portion, said dye changing color upon the application of a heat means.

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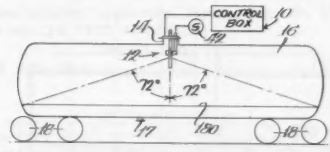
**3,895,756**

## METHOD AND APPARATUS FOR CLEANING VESSELS

**Ben E. Jaeger, Rt. 2, Box 49, Plano, Ill. 60545**

**Filed Mar. 22, 1974, Ser. No. 453,600**
**Int. Cl.² B05B** *3/00, 13/06*
**U.S. Cl. 239—227** **12 Claims**




1. Cleaning apparatus for vessels comprising pressure jet means, means for rotatably mounting said jet means about first and second different axes, first power means for tilting said jet means about said first axis in both directions, second power means for tilting said jet means about said second axis in both directions, and first and second separate control means connected to respective first and second power means for automatically and independently tilting said jet means back and forth about said first and second axes in respective arcs of spray direction.

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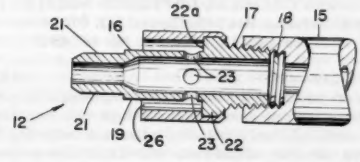
**3,895,757**

## SAFETY TIP AIR NOZZLE

**Edward Di Loreto, 10402 River Rd., Downey, Calif. 90241**

**Filed June 29, 1973, Ser. No. 375,202**
**Int. Cl.² B05B** *01/28*
**U.S. Cl. 239—291** **2 Claims**




1. An air nozzle comprising:
a barrel having an axial passageway with threads formed on the end thereof;

a tubular body having formed at one end threads adapted to engage to threads in said barrel;

said body having at least one radially directed hole communicating with the center passageway thereof and space between the threads thereon and the other end of said body;

said threads on said barrel being female threads;

said body being cylindrical and said threads being male threads;

a cylindrical annular collar formed on said body between said threads and holes thereon;

a cylindrical sleeve having an inside diameter less than the outside diameter of said collar and more than the outside diameter of said body;

said sleeve having a counterbore formed from one end thereof wherein the diameter is of a size to slip around said collar; and

means to allow the bonding of said sleeve to said collar.

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**3,895,758**

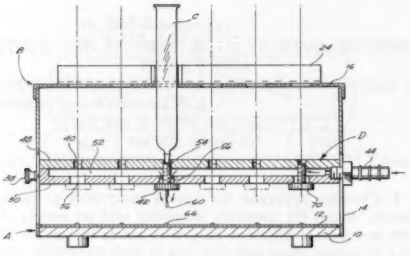
**SPOTTER FOR USE IN THIN LAYER CHROMATOGRAPHY**

**John Thoden, Vineland, N.J., assignor to Kontes Glass Company, Vineland, N.J.**

**Division of Ser. No. 345,975, March 29, 1973, Pat. No. 3,843,053. This application May 22, 1974, Ser. No. 472,438**

**Int. Cl. B05b** *1/14*

**U.S. Cl. 239—296** **7 Claims**



1. A gas manifold for directing a flow of gas from a gas source closely past the drop forming needle in a thin layer chromatographic spotter comprising a nozzle having a channel through which the needle extends, said nozzle being insertable into an aperture in said manifold, said aperture being in fluid communication with said gas source, said nozzle sealingly engaging said manifold to prevent gas escaping from said aperture, said nozzle having passages between said aperture and the exterior of said nozzle radially spaced from said needle channel to direct a flow of gas closely past the needle.

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**3,895,759**

**DRY CHEMICAL DISPERSION NOZZLE**

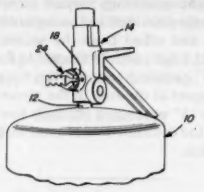
**Joseph S. DePalma, Box 353, Closter, N.J. 07624**

**Filed Aug. 13, 1974, Ser. No. 497,092**

**Int. Cl. B05b** *1/26*

**U.S. Cl. 239—498** **9 Claims**

1. A dry powder dispersion nozzle comprising a body having a discharge passage formed therethrough including inlet and outlet ends, said body including jet stream deflecting means disposed outwardly of said outlet end of said passage operative to successively divide a jet discharge of dry powder from said passage into two outwardly divergent flat discharge paths extending in planes oppositely angularly displaced relative to a diametric plane of the outlet end of said passage and to subsequently divert at least three transversely spaced zone portions of the jet discharge of powder moving along each of said flat discharge paths along outwardly divergent secondary



paths less angulated relative to said diametric plane than said flat discharge paths.

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**3,895,760**

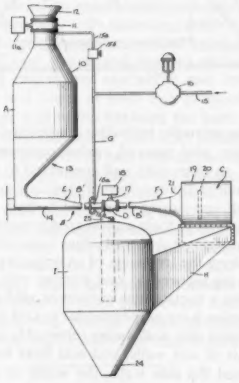
**METHOD AND APPARATUS FOR SHATTERING SHOCK-SEVERABLE SOLID SUBSTANCES**

**Francis Henry Snyder, Newtown, Conn., assignor to Lone Star Industries, Inc., Greenwich, Conn.**

**Continuation-in-part of Ser. No. 361,610, May 18, 1973, abandoned, which is a continuation of Ser. No. 170,087, Aug. 9, 1971, abandoned. This application Nov. 9, 1973, Ser. No. 414,195**

**Int. Cl.[2] B02C** *19/06*

**U.S. Cl. 241—5** **39 Claims**



1. An apparatus for reducing the size of shock-severable material comprising,

a first vessel for receiving the material and defining a first zone,

a second vessel defining a second zone,

a duct extending from the first vessel to the second vessel,

a quick-opening valve in said duct,

means for introducing a predetermined amount of a compressible working fluid into the first vessel including an inlet in said duct adjacent to said valve for introducing at least a substantial portion of said predetermined amount for carrying any of said material in the duct back to the first vessel.

means for closing said valve during the introduction of said fluid into the first zone,

means for opening the valve suddenly to discharge a mixed stream of working fluid and material from said first vessel into the duct, which conducts said stream to the second vessel,

means located between the first vessel and duct for creating a zone wherein the solid material is subjected to shock phenomena as it exits from the first vessel and enters said

duct to thereby shatter and reduce the size of said material,

said quick-opening valve being located a predetermined distance from the first vessel, and

the spacing of the valve from said first vessel and the time of opening said valve being such that said valve moves to fully open position before the material discharged from said first vessel reaches said valve.

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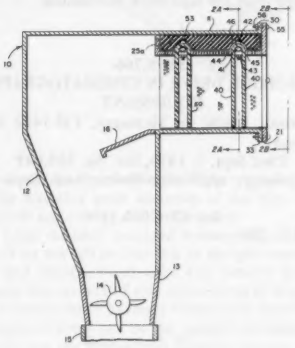
**3,895,761**

## REMOVABLE MUFFLER UNIT FOR GRANULATOR APPARATUS OR THE LIKE

**David G. Mills, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.**

**Filed Dec. 20, 1973, Ser. No. 426,456**
**Int. Cl. B02c** *23/02*
**U.S. Cl. 241—301** **11 Claims**



1. An apparatus for granulating plastic material or the like having a hollow elongate feed section with a feed section opening at one end to receive material to be granulated,

a liner in said feed section, said liner having at least some walls spaced from the interior surface of the feed section to form a cavity therewith,

at least a portion of the liner formed of a porous material, a body of sound attenuating material in said cavity adjacent said porous material portion,

and positioning means for removably mounting the liner and its sound attenuating material within the feed section in such a manner as to hold the liner and its sound attenuating material at a given position when mounted in the feed section while concurrently permitting easy removal of the liner and its sound attenuating material from the feed section as a unit without substantially dismantling the remaining portion of the feed section.

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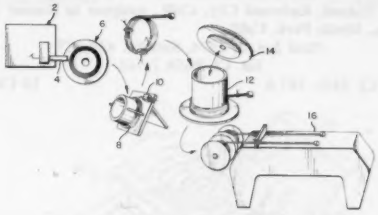
**3,895,762**

## WIRE COILING SYSTEM

**Ralph P. Fletcher, Jr., Snohomish, and Ted C. Pratt, Everett, both of Wash., assignors to Wiretech Corporation, Edmonds, Wash.**

**Filed May 29, 1973, Ser. No. 365,037**
**Int. Cl. B65h** *75/00, 54/00*
**U.S. Cl. 242—54 R** **3 Claims**

1. A method of producing an electrical wire harness for installation in aircraft and the like comprising the steps of individually forming a plurality of coils of wire on a powered wire coiling device, wherein the inside diameter of the coils are relatively uniform, maintaining tension on the wire as the respective coils are formed to produce relatively tightly wound coils, removing each coil of wire from the wire coiling device after a coil of desired length is formed, processing the individual coil to join the exposed ends of two or more coils, positioning a plurality of coils of varying length, outside diameter and sizes of wire on a common spool in side-by-side relationship and wherein the respective coils are free to rotate



relative to the spool, joining the exposed ends of all of the coils of wire on the spool by means of a single clamping connector means and withdrawing the wires from the separate could simultaneously to permit the layout of the harness with the respective wires in the desired relationship and position.

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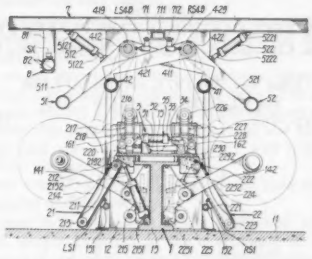
**3,895,763**

## METHOD AND APPARATUS FOR SPLICING PAPER ROLLS

**Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan**

**Filed Mar. 29, 1973, Ser. No. 345,849**
**Claims priority, application Japan, Aug. 29, 1972, 47-86942; Nov. 14, 1972, 47-114578**
**Int. Cl. B65h** *19/16*
**U.S. Cl. 242—58.3** **11 Claims**



1. A continuous method of splicing the leading end of a fresh web roll which is releasably attached to said roll and which is not yet unwound, with a running web which is being continuously drawn from an expiring roll, without interrupting the continuous operation thereof, so that the smooth face of the leading end of the fresh web roll corresponds to the smooth face of the expiring roll and the rough face of the leading end of the fresh web roll corresponds to the rough face of the expiring roll which comprises pushing a rotatable web-pushing roll against the web running from the expiring roll thereby moving said running web towards the fresh web roll which is not yet unwound and causing said running web to contact a rotatable intermediate roll which is disposed near said fresh roll, rotating the fresh web roll in synchronization with the unwinding speed of the expiring roll, causing the web-pushing roll to push the intermediate roll into contact with the rotating fresh web roll, the running web of the expiring roll being grasped between the intermediate roll and the web-pushing roll, temporarily fastening the leading end of the fresh web roll to the surface of the intermediate roll, thereby drawing out the leading end from the fresh web roll, and

splicing the leading end of the fresh web roll to the running web of the expiring roll by causing said leading end to attach to said running web.

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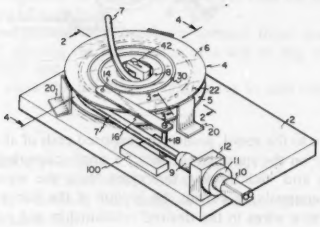
**3,895,764**

## DENTAL RETRACTING DEVICE

**Max Roland, Redwood City, Calif., assignor to Roland Mfg. Co., Menlo Park, Calif.**

**Filed Jan. 2, 1974, Ser. No. 429,887**
**Int. Cl. B65h** *75/48*
**U.S. Cl. 242—107.6** **15 Claims**



**1.** A device for supplying and retrieving a hose like member comprising:

a base support member, a hose collecting reel rotatably mounted to said support member, and a hose separating means, said hose collecting reel having an upper and lower disk plate and a spiraled cut-out raceway in one of said disk plates for receiving said hose separating means and thereby maintaining a separation between the coils of said hose like member as said member is coiled or uncoiled on said collecting reel.

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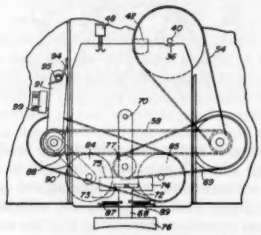
**3,895,765**

## REEL TO REEL CARTRIDGE TAPE PLAYER SYSTEM

**Hugo Korn, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.**

**Filed Nov. 19, 1973, Ser. No. 417,350**
**Int. Cl. G03b** *1/04*; **G11b** *15/32*
**U.S. Cl. 242—194** **16 Claims**



**1.** In a magnetic tape device having a housing with an opening adapted to receive a cartridge having magnetic recording tape therein, a tape drive mechanism including a capstan positioned to frictionally engage the tape within the cartridge to drive the same, and a transducer head positioned to be adjacent the tape in the cartridge for cooperating therewith, the combination including,

a cartridge having two reels mounted coaxially therein with magnetic tape thereon, each of said reels being independently rotatable and having an outer rim protruding from said cartridge,

drawer means adapted to receive and hold said cartridge, said drawer means being slidably movable in the housing opening between a first position for holding said cartridge away from the tape drive mechanism and a second position to hold said cartridge in playing position against the tape drive mechanism,

drive means within the housing including a portion positioned to engage said reels protruding from said cartridge, and selectively engageable with said reels to drive a selected one of said reels,

switch means actuated by said portion of said drive means for controlling the operation of said drive means, and

control means movably mounted to said housing and engageable with said drawer means and operatively connected to said drive means, said control means being movable between a first position to cause movement of the tape in one direction by engagement of said drive means with one of said reels and a second position to effect engagement of said drive means with the other one of said reels to cause movement of the tape in the opposite direction, said control means acting through said drawer means to disengage said magnetic tape within said cartridge from the tape drive mechanism.

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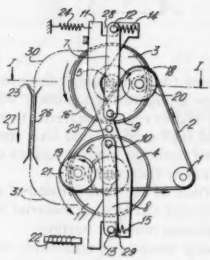
**3,895,766**

## FILM-SPOOL DRIVE IN CINEMATOGRAPHIC EQUIPMENT

**Jean Thevenaz, Ruelle de Montagny, CH-1422 Grandson, Switzerland**

**Filed Sept. 7, 1973, Ser. No. 395,047**
**Claims priority, application Switzerland, Sept. 8, 1972, 13590/72**
**Int. Cl. G03b** *1/54*
**U.S. Cl. 242—205** **3 Claims**



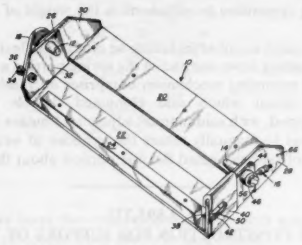
**1.** A film spool drive apparatus for cinematographic equipment comprising first and second film spool support plates, drive means selectively coupled to each of said plates for driving said first plate in a direction to wind the film on its associated spool and to drive the said second plate to unwind the film on its associated spool, and control means operable in response to a predetermined amount of tension in the film loop associated with each of said respective plates for disengaging the drive means from said first plate when its associated film loop tension is above a predetermined amount and for engaging said drive means with said second plate when its associated film loop tension is above a predetermined amount, and wherein said drive means includes first and second wheels, each having a driving surface operatively cooperating with a driving surface of the respective first and second plates, and said control means comprises first and second members coupled to the first and second plates for moving said plates into and out of operable engagement with said respective wheels.

3,895,767

## QUICK ATTACHABLE TOW CABLE ADAPTER FOR A-7 AIRPLANES

Richard K. Maughlin, Great Milk, and John B. Dexter, California, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 9, 1974, Ser. No. 504,611
Int. Cl.[2] B64D 3/02
U.S. Cl. 244—3 4 Claims



1. A tow adapter for coupling with the recesses in the apical nuts of the arresting hook assembly of the type used in A-7 naval aircraft comprising, in combination:

a fore cross member oriented transversely to the fore-aft axis of an aircraft and having an upright member at each port and starboard end, each end member having a hole therein, the centers of said holes being in alignment, said fore cross member having a folded-over member at its aft end spaced from one of the upright members, both the upright and the folded-over member having corresponding slots extending in a fore-aft direction from the extreme aft portions of the members;

an aft cross member spaced aft from and parallel to said fore-cross-member, said aft cross member having a pair of upright end members affixed thereto and adjacent to said fore-cross-member upright members, the upright member on one side of the fore-aft axis of the aft cross member having a hole therein aligned with the hole in its adjacent fore-cross-member upright member, the upright member on the other side of the aft cross member fitting inside the space between the folded-over member and its upright member and having a hole therein aligned with the hole in its adjacent fore-cross-member upright member and being formed with a tongue at its aft end and with an opening positioned fore of the tongue, said tongue covering the aft part of the fore-aft slots in its normal position and the opening in the aft upright member corresponding in position with the non-covered part of the fore-aft slots; and

a pair of support pins extending through the holes in the upright members, a different one through each upright member for engagement with the nut recesses of an arresting hook assembly, one pin being easily removable from its associated holes;

biasing means attached to one of said pins and to an aft-cross-member upright member for biasing said aft cross member to a normal position wherein said tongue covers the aft portion of said fore-aft slots, said aft cross member being depressible relative to said fore cross member; and locking means for preventing removal of said easily removable pin from its holes,

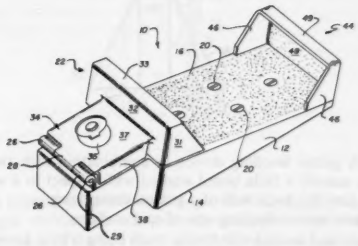
a towing ring being insertable in said foreaft slots when said aft cross member is depressed, said tongue extending through said towing ring when the aft cross member is released and being locked in place around said tongue until said aft cross member is again depressed.

3,895,768

## SECURITY CLAMP

Harold G. Scheck, 726 S. Kenilworth Ave., Oak Park, Ill. 60304

Filed Feb. 8, 1974, Ser. No. 440,822
Int. Cl. F16m 13/00
U.S. Cl. 248—19 5 Claims



1. A security clamp for lockingly engaging and retaining an electronic calculator and other such devices having an overall substantially rectilinear configuration, comprising in combination,

a base having securement means for securing said base to an underlying support surface,

lock receiving means associated with said security clamp adjacent one end thereof,

an upper retention arm pivotally mounted on said base for overlapping and retaining one end of the device positioned on said base,

lock means associated with said security clamp and positioned in cooperative relationship with said lock receiving means, thereby to permit locking engagement of said lock means with said lock receiving means and lockingly engage said arm in retention position with respect to the device positioned thereon,

a lower retention bridge carried on said base adjacent the opposed end thereof,

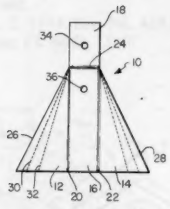
said base including arrest means positioned adjacent the end thereof opposed to the positioning of said upper retention arm and including a plurality of arrest positions, said lower retention bridge including engagement means positioned for corporative co-action with said arrest means thereby to permit variable adjustment of said lower retention bridge along said base by positioning said engagement means in engaged relation with respect to one of said arrest positions of said arrest means and permit varying the distance between said lower retention bridge and said upper retention arm,

whereby said base may be fixedly secured to an underlying support surface by way of said securement means, and said lower retention bridge may then be adjustably varied to accommodate the length of the device to be positioned therein, and said upper retention arm pivotally moved to an open position, permitting the positioning of an electronic calculator, or other such device on said base, such that one end of the device is arrested by said lower retention bridge and thereafter said retention arm is lowered into the retention position about the opposed end of the device, and the lock means then activated to coact with said lock receiving means and lockingly engage said retention arm in the closed position to securely lock the device in position within said security clamp.

## 3,895,769
## GUTTER LEVELLING DEVICE

Boynton Craig Hagaman, Box 99-B, Rt. 2, Purcellville, Va. 22132

Filed Aug. 7, 1973, Ser. No. 386,319
Int. Cl. E04d *13/06*
U.S. Cl. 248—48.2 5 Claims




1. A gutter levelling device in combination with two surfaces, namely a facia board slanted with respect to a vertical plane and the back wall of a gutter, comprising:

a base means abutting one of said surfaces;

a first and second web means, each being triangular shaped, extending substantially perpendicularly from said base means, and terminating in a first straight line abutting the other of said surfaces;

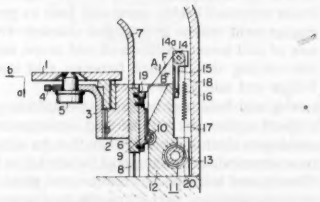
at least one line of perforations on each web means defining an angle with said base member smaller than the angle said first terminating line makes with said base member, making the angles adjustable by removing a portion of each web means along said lines of perforation to define a second terminating straight line; and

an attachment means extending from said base means and forming with the means, which abuts the back wall of said gutter, a generally U-shaped closure receiving the back wall of said gutter between the legs of said U-shaped closure whereby said gutter is maintained level when installed to said slanted facia board by either the first or second terminating line of said web means.

## 3,895,770
## WEIGHT BALANCING MECHANISM FOR USE IN PRECISION ELEVATING AND LOWERING MEANS

Isamu Yoshida, Kokubunji, and Toshimi Hayasaka, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 16, 1973, Ser. No. 379,316
Claims priority, application Japan, July 15, 1972, 47-71138
Int. Cl. G12b *3/00*
U.S. Cl. 248—123 1 Claim



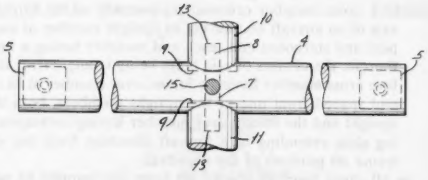

1. A weight balancing mechanism for use in precision elevating and lowering means, comprising object means having a variable weight, elevating and lowering means coupled to said object means at a location which is laterally displaced from the center of gravity of the object for precisely elevating and lowering said object means in a vertical direction, a tension member including a spring portion fixed at one end to said object means and fixed at its other end to a mounting mechanism remote from said object means said tension member extending at an oblique angle from said object means with respect to the vertical direction in the sense which causes the application of both vertical and horizontal force component to said object means in opposition to the weight and weight moment of the object means about said elevating and lowering means, respectively, said mounting mechanism including manual adjustment means for altering the tension upon said object means and said mechanism to thereby selectively increase or decrease the force exerted on said object means in corresponding opposition to variations in the weight of said object means;

said tension member including an elongated flexible portion extending from one end of the spring portion and wherein said mounting mechanism comprises a cylindrical member about which said elongated flexible portion is wrapped, with said manual adjustment means comprising means to manually rotate the cylinder to wrap more or less of said elongated flexible portion about the cylinder.

## 3,895,771
## BASE CONSTRUCTION FOR SUPPORT OF TABLE STRUCTURE OR THE LIKE

Elliot W. Baum, Maryland Heights, Mo., assignor to Berco Industries, St. Louis, Mo.

Filed Dec. 13, 1973, Ser. No. 424,188
Int. Cl. F16m *11/20*
U.S. Cl. 248—188.7 11 Claims




1. In a metallic base construction for use in support of a table structure or the like mounted upon at least one centerpost comprising, an elongated rod member having a length sufficient to stabilize in two directions the structure it is designed to support, said rod member having an aperture provided transversely therethrough and approximately at its midpoint, said rod member being counterbored into its sides and concentrically with the formed aperture, a pair of additional rod members, one end of each additional rod members being axially arranged into said counterbores and totally concealing therein their inserted ends, fastening means arranged through said aperture and projecting through the counterbores to secure the pair of rod members when fitted into said counterbores, and fastening means cooperating with the upper surface of at least one of said rod members to secure the centerpost in place.

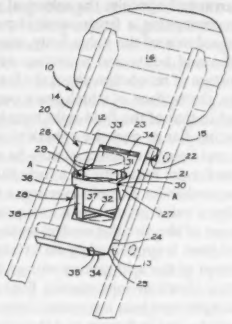
## 3,895,772
## DEVICE FOR SUPPORTING A BUCKET ON A LADDER

Erling Ellingson, R.R. No. 1, Creek Rd., Beloit, Wis. 53511

Filed Feb. 25, 1974, Ser. No. 445,442
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—210 5 Claims

1. A device for supporting a container on a ladder having a plurality of rungs, said device comprising a rigid base of sheet material, a hook formed on one end of the base adapted to hang said base on one of the rungs, a portion of the base engagable with another of the rungs to restrain rotation of the base around said one rung, said hook and said portion defining a plane of the base, an aperture in said base between the hook and said portion, a pair of spaced brackets bent fowardly from the base, means for receiving and supporting the container,

and aligned pivots mounting said means on the brackets about an axis parallel to said rungs and displaced from the plane to



substantially level the container and to permit substantially unobstructed access from above to said means.

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3,895,773

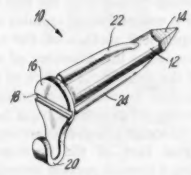
## MOLDED WALL FASTENER

**Alan J. Solo, Brooklyn, N.Y., assignor to Knock-N-Lok International, Inc., Brooklyn, N.Y.**

**Continuation-in-part of Ser. No. 474,872, May 31, 1974, which is a continuation-in-part of Ser. No. 469,666, May 14, 1974, which is a continuation-in-part of Ser. No. 463,820, April 24, 1974, which is a continuation-in-part of Ser. No. 454,393, March 25, 1974. This application Aug. 26, 1974, Ser. No. 500,537The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.**

**Int. Cl.[2] F16B** *15/04*

**U.S. Cl. 248—217** **11 Claims**



1. A wall fastener for use in relatively brittle penetrable walls comprising an elongate shank, said shank having one end thereof pointed and suitable for being driven into a penetrable wall; an engageable head at the other end of said shank suitable for being hammered to advance the pointed end of said shank through the penetrable wall and for being engaged to permit turning of said shank about the axis thereof; at least one projection extending from said shank proximate to the pointed end and inclined relative to said shank in the direction of said head, said projection being integrally formed with said shank and being flexible and resilient to permit the same to be deformed and at least partially wrapped about the axial length of said shank, whereby hammering the fastener into a penetrable wall causes the wall material to flex said projection to a position substantially coextensive with said shank, and engagement of said head and turning of the latter to thereby cause simultaneous rotation of said shank about the axis thereof, causes said projection to flex and become twisted about said shank, the resiliency of said projections causing the same to tend to flare radially outwardly from the axis of said shank to become wedged between the latter and the wall material to thereby secure the fastener in place and resist the same from becoming removed from the wall.

3,895,774

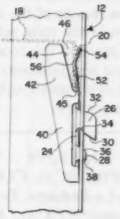
## SHELF SUPPORT CLIP

**Larry L. Sharp, Schaumburg, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Nov. 27, 1973, Ser. No. 419,324**

**Int. Cl.[2] A47B** *29/02*

**U.S. Cl. 248—243** **15 Claims**



1. A support assembly including a vertical support member, a flanged shelf and a one piece shelf support clip for use in supporting said flanged shelf relative to said vertical support member said vertical support member having a plurality of spaced apertures for selectively accepting said clip in a multiplicity of positions, said clip including a plate-like base, a hook-shaped locking prong extending out from said base and engaging one of said apertures, means engaging a second spaced aperture to prevent rotation of said clip and maintain it in vertical alignment, at least one shelf engaging means extending from said base in the opposite direction from said prong, and resilient means extending from said base and located between the flange of said shelf and said support and engaging both said support and said shelf to maintain said prong and shelf in mounted rattle-free condition.

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3,895,775

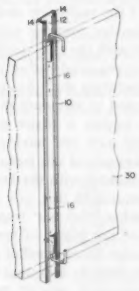
## FRAMELESS PICTURE HANGING

**Thomas K. Norton, P.O. Box 29, Cambridge, Mass. 02139**

**Filed Dec. 19, 1973, Ser. No. 425,998**

**Int. Cl.[2] A47G** *1/24*

**U.S. Cl. 248—476** **1 Claim**



1. A device for detachably securing a picture in vertical position against a wall, said device comprising:

first and second vertical rails having vertical recessed channels and secured to the wall in spaced parallel position;

first and second downwardly extending hooks having downwardly pointing shanks;

first and second plates, each first and second plate being detachably and slidably engagable with a corresponding vertical channel and having a recess receiving a corresponding one of the shanks of the first and second hooks to hold the first and second hooks in desired positions in

said rails, each channel having a plurality of vertically spaced openings;

third and fourth upwardly extending hooks having upwardly pointing shanks, the top end of each shank of the third and fourth hooks having a horizontal finger engagable with any opening in the corresponding channel; and

third and fourth plates, each third and fourth plate being detachably and slidably engagable with a corresponding vertical channel and having a recess receiving a corresponding one of the shanks of the third and fourth hooks in desired positions in the rails, whereby the four hooks can be adjusted in position to accomodate different sized pictures, the first and second hooks engaging the top edge of the picture, the third and fourth hooks engaging the bottom edge of the picture.

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**3,895,776**

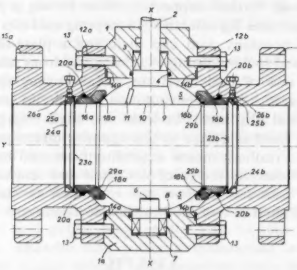
## VALVE WITH A SPHERICAL CLOSURE-MEMBER

**Roger Laurens, Ensues-La-Redonne, France, assignor to Pipeline Equipment Company E.P.C.O., Marseille, France**

**Filed Mar. 26, 1974, Ser. No. 454,934**

**Int. Cl. F16k** *5/06*

**U.S. Cl. 251—148** **6 Claims**



**1.** A valve or cock with a completely dismantlable spherical closure-member interposed between two tubular elements of the same conduit system, comprising: a substantially cylindrical valve body constituting the support of a spherical closure-member with a cylindrical orifice, movable in rotation about the longitudinal axis of the said body and with respect to this latter, and provided for that purpose with a pivot-pin and an operating shaft coaxial with the said longitudinal axis, the said shaft being provided as required with a means for preventing ejection of the said operating shaft by the effect of the pressure of the fluid intended to circulate in the conduit system, the said valve body having a plane of symmetry passing through its longitudinal axis and having a cylindrical transverse orifice with a longitudinal axis perpendicular to its plane of symmetry which coincides with the longitudinal axis of the conduit system and intersects this axis at the centre of the spherical closure member, the said transverse orifice being limited on each side of the plane of symmetry of the valve body by two flat annular faces parallel to the said plane of symmetry; two spacing flanges identical with each other and coaxial with the longitudinal axis of the transverse orifice formed in the valve body, the common axis coinciding with that of the conduit system containing the valve, the two said spacing flanges being symmetrical with each other with respect to the plane of symmetry of the valve body, each of them being fixed on the said valve body, on the one hand by fitting one of its transverse end-faces into the corresponding inlet of the transverse cylindrical orifice of the valve body, the transverse faces in contact being complementary in shape with each other, a fluid-tight joint being interposed between two of the faces in contact, and on the other hand by removable means for fixing together the parts in contact, the said spacing flanges having on their transverse faces opposite to those by which they are fixed on the valve body, means for coupling each of them to one of the conduit elements between which the valve is interposed, the internal portion of each of the said spacing flanges arranged opposite the spherical portion of the closure member comprising a frusto-conical portion coaxial with the longitudinal axis of the valve body, open and placed on the side of the said body, and a portion adjacent to the frusto-conical portion of revolution about the longitudinal axis of the valve body, the surface of which has a pseudo-cylindrical shape adapted to that of the fluid-tight member interposed between the spacing flange and the spherical surface of the closure member and being provided, as may be required, with an annular groove for the reception of a toric fluid-tight joint, which annular goove has for its radial section a rectangle, the width of which has a value greater than and a depth less than that of the diameter of the circular central section of the toric joint, which toric joint is supported by its external equatorial circle on the bottom of the said groove along which it can be displaced; and two identical joint-carrier fluid-tight seatings forming the fluid-tight members interposed between the internal face of each of the facing flanges and the spherical surface of the closure member, and each constituted by a body of revolution arranged in the normal position on the one hand coaxially with each other, their axes of revolution then coinciding with the longitudinal axis of the conduit system and on the other hand symmetrically with each other with respect to the plane of symmetry of the valve body, each of the said seatings have a cylindrical orifice the axis of which coincides with its axis of revolution and the internal diameter is equal at the same time to the internal diameter of the cylindrical orifice of the closure member and to the internal diameter of the conduit system; having an internal face of substantially frusto-conical shape, the axis of revolution of which is that of the said seating and which is arranged facing the spherical surface of the closure member and in the immediate vicinity of this latter, provided with an annular groove for the reception of a toric fluid-tight joint having the axis of revolution of the seating as its longitudinal axis, which toric joint is supported on the spherical surface of the closure member along a circle of the said spherical surface, and provided as may be required, with an annular housing coaxial with the axis of revolution of the seating in which is embedded an annular scraper segment supported on the spherical surface of the closure member along a circle of this latter the diameter of which is slightly greater than that of the cylindrical orifice of the said closure member, the said scraper segment co-operating with the said closure member; having an external lateral face substantially of revolution about its longitudinal axis arranged opposite the corresponding internal face of the corresponding spacing flange and comprising a conical portion arranged opposite the conical portion of the said internal face, and a pseudo-cylindrical portion arranged opposite the pseudo-cylindrical portion of the said internal face having the shape adapted to this latter, the said pseudo-cylindrical external face being provided as may be required with an annular groove for reception of the toric fluid-tight joint, the external equatorial circle of which is in contact with the internal lateral pseudo-cylindrical face of the spacing flange and the internal equatorial circle is in contact with the external lateral pseudo-cylindrical surface of the corresponding joint-carrier seating, which annular groove has for its radial section a rectangle the width of which has a value greater than and the depth has a value lower than that of the diameter of the circular central section of the toric joint, which is supported by its internal equatorial circle on the bottom of the said groove, the respective shapes of the lateral internal pseudo-cylindrical face of the housing of the joint-carrier seating in the spacing flange and of the external lateral pseudo-cylindrical face of the said seating being such that the distance separating them is a minimum at the level of the said fluid-tight toric joint; being provided with a transverse face opposite to the frusto-conical face placed facing the spherical face of the closure member and which co-operates with a compressible elastic member supported directly or through the intermediary of a rigid member on a shoulder formed on

the internal lateral surface of the spacing flange, the position of the said compressible member on which is supported the transverse face of the seating opposite to its frusto-conical face placed facing the spherical face of the closure member being capable of being axially regulated as may be required, the said compressible elastic member being constituted for that purpose by an elastic washer supported on an annular ring, the external diameter of which is equal to the internal diameter of the corresponding spacing flange and the external diameter is slightly greater than that of the elastic washer, the said annular ring being arranged in a cylindrical housing extending the housing of the external frusto-conical lateral face open towards the said seating and constituting an inclined ramp co-operating wth the frusto-conical extremity having an apex angle complementary to the apex angle of the frusto-conical face of the said annular ring of at least one screw the longitudinal axis of which is arranged radially, intersects the longitudinal axis of the corresponding spacing flange and co-operates with a threaded portion formed in the said coupling flange, and said screw being provided with fluid-tight closure means and means for driving in rotation about its axis.

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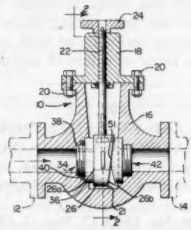
**3,895,777**

## GATE VALVE

**Earl G. Althaus, 3208 Jacks Ln., Louisville, Ky. 40216**

**Filed Sept. 26, 1974, Ser. No. 509,718**
**Int. Cl.[2] F16K** *25/00*
**U.S. Cl. 251—203** **6 Claims**



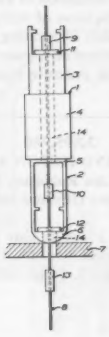
1. A gate valve comprising:
a. a valve body having a horizontal flow passage extending therethrough and an enlarged central cavity in communication with said flow passage,
b. a valve seat secured in fixed position within said flow passsage,
c. a gate vertically moveable within said cavity in said valve body,
d. said gate having a wedge-shaped body with a vertically extending planar face and a tapered face,
e. operating means for moving said gate relative to said valve seat so that said planar face contacts said valve seat to regulate the flow through the valve body,
f. plug means secured in fixed position within said flow passage, and
g. said plug means including at least one resilient lug that contacts the tapered face of said gate as said gate is moved downwardly to thereby cam the planar face of said gate against said valve seat.

**3,895,778**

## METHOD OF LOWERING AND RAISING LOADS BY MEANS OF A JACK ASSEMBLY AND LIFTING ELEMENT

**Nils Harald Ahlgren, 22 Skyttevagen, S-133 00 Saltsjobaden, Sweden**

**Filed Jan. 5, 1973, Ser. No. 321,154**
**Claims priority, application Sweden, Jan. 12, 1972, 295/72**
**Int. Cl. B66f** *1/00*
**U.S. Cl. 254—1** **1 Claim**



1. A method of lowering and raising a load by means of a jack assembly and lifting element, which comprises transferring the load from the lifting element by supporting means moveable along said lifting element and alternately carrying the supporting means by one-and-then the other of two carrying means having holes accommodating the passage of the lifting element, with said carrying means being mounted on relatively moveable parts of the jack assembly, and said lifting element being joined in series with other lengths of lifting element by connectors of a size incapable of passing through the holes of the carrying means, and alternately dismounting the carrier means to permit free passage of the connectors and thus the joined lengths of the lifting element.

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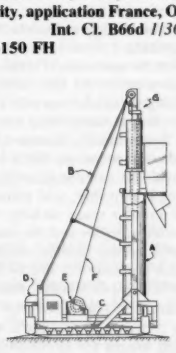
**3,895,779**

## HOISTING WINCH, IN PARTICULAR FOR A BORING MACHINE

**Pierre Cassez, Bethune, and Claude Pelisson, Seclin, both of France, assignors to Benoto-Sam, Paris, France**

**Filed Oct. 3, 1973, Ser. No. 403,004**
**Claims priority, application France, Oct. 3, 1972, 72.34951**
**Int. Cl. B66d** *1/30*
**U.S. Cl. 254—150 FH** **16 Claims**



1. A winch for hoisting a load and allowing the load to fall freely, comprising a support, a drum which is rotatably mounted relative to the support, a traction cable wound round the drum for attaching to the load, a hydraulic drive motor

permanently coupled to said drum for rotating the drum and comprising first and second main fluid pressure ports, a control fluid pressure port, a stator and a rotor, said winch further comprising a fluid supply device having pump means, a tank and a control device for selectively connecting said main fluid pressure ports to said pump means and said tank, said control device comprising first pipe means connecting said second main fluid pressure port to said tank and second pipe means connecting said first pipe means to said control fluid pressure inlet port for continuously applying thereto a control fluid pressure, whereby upon actuation of said control device, said rotor is drivable by application of main fluid pressure to said first inlet port and capable of rotating freely with respect to said stator from the moment of release of said control device by virtue of control fluid pressure remaining in said second pipe means.

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**3,895,780**

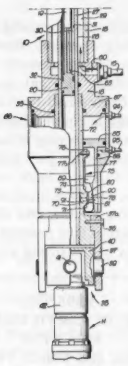
## CYLINDER AND PISTON APPARATUS

**Edward Larralde, and Glen Robinson, both of Santa Barbara, Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.**

**Division of Ser. No. 274,880, July 25, 1972, Pat. No. 3,841,607. This application Nov. 19, 1973, Ser. No. 417,209**

**Int. Cl. B66d** *1/48*

**U.S. Cl. 254—172** **11 Claims**



**3.** An apparatus for maintaining a predetermined stress in a running string: comprising cylinder means; piston means slidable in said cylinder means; one of said means having means for operative connection to the running string; the other of said means having means for operative connection to a support; said cylinder means comprising an outer member and an inner member therewithin and secured to said outer member, said inner and outer members being laterally spaced from each other to provide an annular space therebetween in which said piston means is movable; said piston means comprising a piston in said annular space slidably sealing against the inner wall of said outer member and the outer wall of said inner member; said piston means further comprising a piston rod secured to said piston and laterally spaced from said inner wall of said outer member and in slidable sealing relation to said outer and inner members; said piston rod being laterally spaced from said inner member to provide a second annular space therebetween; and means for simultaneously directing a fluid medium under pressure into the space between said piston rod and inner wall of said outer member for action upon said piston on one side of said piston and into said second annular space for action upon said piston on the same side of said piston.

**3,895,781**

## APPARATUS FOR APPLYING GLUE TO WOOD SHAVINGS, FIBERS AND SIMILAR CELLULOSE CONTAINING SUBSTANCES

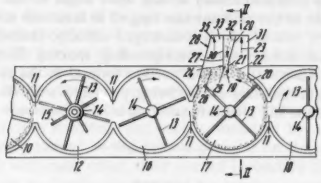
**Wilhelm Lodige; Fritz Lodige; Josef Lucke, all of Paderborn; Wilhelm Schluter, Schwaney, and Heinrich Beckschulte, Scharmede, all of Germany, assignors to Wilhelm Lodige; Fritz Lodige and Josef Lucke, all of Paderborn, Germany**

**Filed Jan. 2, 1973, Ser. No. 320,590**

**Claims priority, application Germany, Dec. 31, 1971, 2165878**

**Int. Cl. B01f** *7/04*

**U.S. Cl. 259—25** **24 Claims**



**1.** A device for applying dry glue to shavings, fibers and similar cellulose containing substances, especially wood and waste bagasse, which includes in combination: mixing chamber means with cylindrical chamber wall means and rotating agitating means for receiving and mixing the cellulose containing substance with glue, and circulating the thus formed mixture along said cylindrical chamber wall means, deflector means extending into said mixing chamber means for creating a zone of turbulence in a mixture circulating in said mixing chamber means, and conveying means having its mouth located within said mixing chamber means within the range of stagnation action of said deflector means for feeding only pulverous dry glue into said mixing chamber means, said mixing chamber means including at least one venting zone arranged within the range of action of said deflector means.

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**3,895,782**

## PROCEDURES AND FACILITIES EMPLOYED FOR ELIMINATING OXYGEN IN OXIDES

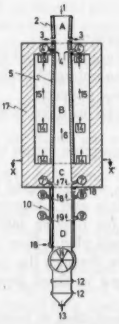
**Eduardo de Delas y de Ugarte, Barcelona, Spain, assignor to Servicios de Ingenieria, Proyectos Y Estudios/(SIPE), Barcelona, Spain**

**Continuation of Ser. No. 195,077, Nov. 2, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,197**

**Claims priority, application Spain, Aug. 11, 1971, 394143**

**Int. Cl. C21b** *1/04*

**U.S. Cl. 266—24** **3 Claims**



**1.** Means for performing highly efficient low temperature oxide reduction comprising a vertical retort for treating a load

of a material to be deoxidized, said retort having an opening at the top thereof for the introduction of said material mixed with a solid reducer into the interior of said retort, said solid reducer causing a large proportion of the reduction of said material, said retort further having, from top to bottom, a preheating zone, a heating zone, a holding zone, and a cooling zone; means for indirectly heating said load through the walls of said retort, said load and the means employed as heating agents being kept separated at all times; means located beneath said heating zone for injecting into the interior of said retort at a plurality of different vertical levels an excessive amount of a preheated, powerful reducing gas, whereby an ascending flow of gas is created through said load which acts as a catalyzer for accelerating the reactions in said load to complete the reduction thereof, the reducing process being initiated upon entrance of the mixture into the reducing zone, and which acts as a deoxidizing and treating agent for securing a carburized and desulfurized metal product, the product of said reaction ascending within said vertical retort and directly heating material in the preheating region.

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**3,895,783**

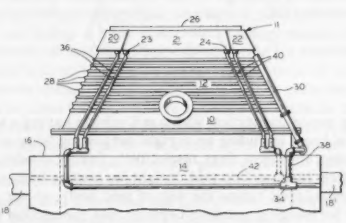
## COOLING ASSEMBLY FOR STEEL CONVERTER VESSELS

**Howard M. Fisher, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.**

**Continuation of Ser. No. 400,268, Sept. 24, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,272**

**Int. Cl. C21c** *5/42*

**U.S. Cl. 266—35** **5 Claims**



1. A metallurgical converter vessel having an opening in the upper end thereof for receiving and discharging metal,

a plurality of metallic segments each separately releasably securable to the outer surface of said vessel and in surrounding relation to said opening, said segments forming a generally annular heat exchanger with the upper outside surface of said vessel,

each of said segments including a generally hollow elongate body portion having a cooling fluid inlet and a cooling fluid outlet disposed on substantially the opposite ends thereof and in fluid communication with said hollow interior,

said segments each having an inner surface of one of its larger dimensional sides generally conforming to a portion of the outer surface of said vessel,

each of said segments also including a pair of elongate flange portions each extending along one of the lateral sides of said body portion and also extending in general conformity with an adjacent outer portion of said vessel, one of said flange portions extending downwardly from said body portion and being secured to the side of said vessel for releasably securing said segments to said vessel with said inner surface thereof in heat exchange relation with the surface of said vessel for cooling and supplying mechanical support for the open end of said vessel,

the other of said flange portions extending inwardly toward said opening, and ring means secured to and joining the other of said flange portions.

**3,895,784**

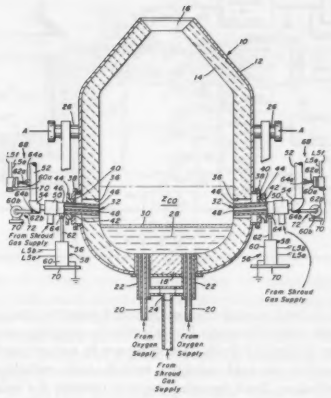
## APPARATUS FOR AND METHOD OF OPTIMUM BURNING OF CARBON MONOXIDE IN A CONVERTER

**William A. Kolb, Forest Hills Borough, and Jack F. Sigh, Crafton Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 295,761, Oct. 6, 1972, abandoned. This application Nov. 24, 1972, Ser. No. 309,018**

**Int. Cl. C21c** *5/46*

**U.S. Cl. 266—35** **22 Claims**



1. Apparatus for the optimum burning of carbon monoxide produced in a carbon monoxide zone above a molten metal bath in a converter to carbon dioxide thereby producng a substantially maximum amount of heat within said converter to melt scrap in said converter, said apparatus having:

a side tuyere mounted in said converter above the level of the molten metal bath;

means for supplying oxygen through said tuyere into said converter and into contact with carbon monoxide in said carbon monoxide zone;

sensing means associated with said converter for sensing an initial effectiveness signal of the amount of carbon monoxide in said carbon monoxide zone being burned to carbon dioxide at a predetermined point relative to said converter, said sensing means being operable to monitor a continuing effectiveness signal;

comparison means connected to said sensing means for comparing said continuing effectiveness signal with said initial effectiveness signal; and

tuyere operating means including program means connected to said comparison means and said side tuyere for moving said side tuyere in a horizontal and a vertical direction in a predetermined order relative to said converter when said continuing effectiveness signal is greater than said initial effectiveness signal to increase the amount of carbon monoxide in said carbon monoxide zone being burned to carbon dioxide.

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**3,895,785**

## METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF A STEEL REFINING CONVERTER

**William A. Kolb, Pittsburgh, and Pete Vignovich, Bethel Park, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 277,017, Aug. 1, 1972, abandoned. This application Dec. 4, 1972, Ser. No. 312,173**

**Int. Cl. C21c** *5/48*

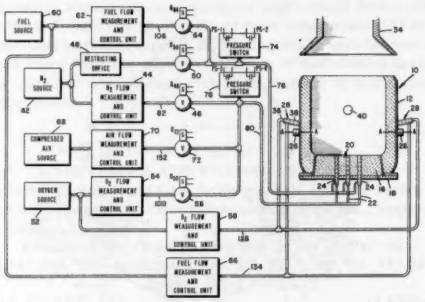
**U.S. Cl. 266—35** **48 Claims**

1. Apparatus for controlling the operation of a steel refining converter of the type having at least one tuyere therein, said

tuyere consisting of a center jet positioned within an annulus jet, and said tuyere being submerged below the level of the molten metal in the converter at least a portion of the time, comprising:

a. selector means for selecting a first or a second set of fluids to be coupled to said tuyere,

b. fluid control means for coupling sources of said first and second sets of fluids to said tuyere, and



c. switching means connecting said selector means to said fluid control means for selectively coupling said first or second sets of fluids to said tuyere in accordance with the position of said selector switch, said switching means including fluid transfer control means for maintaining flow of one of said first and second sets of fluids after the other of said sets of fluids has been selected until flow of said other set of fluids has been established, said apparatus preventing a molten charge in said converter from entering said tuyere and causing damage thereto.

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**3,895,786**

## TILTABLE CONVERTER

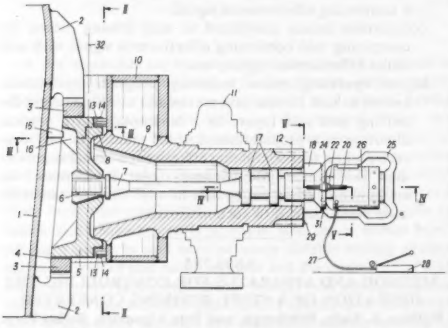
**Manfred Eysn, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria**

**Filed July 2, 1974, Ser. No. 485,296**

**Claims priority, application Austria, July 12, 1973, 6131/73**

**Int. Cl. C21c** *5/46*

**U.S. Cl. 266—36 P** **8 Claims**



1. A tiltable converter comprising:

a converter casing,

supporting elements, accommodating supporting- and tilting forces,

a carrying ring having two hollow supporting trunnions provided with bores, the supporting trunnions lying opposite each other, on which carrying ring the converter is borne by means of said supporting elements,

supporting disks assigned to the supporting trunnions, said supporting disks engaging in bearing eyes secured to the converter casing, the supporting disks being axially movable by means of shifting devices penetrating the bores of the supporting trunnions, each supporting disk being connectable by a quickly detachable connecting means with the pertaining shifting device and

a seating provided at the supporting trunnion, with which the carrying disk is engageable and disengageable by operating the shifting device, while maintaining the engagement of the supporting disk in the bearing eye.

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**3,895,787**

## RAILWAY AIR SPRING BELLOWS

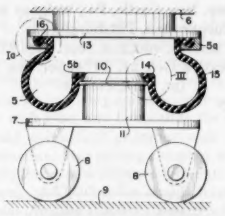
**Gunther Niehus, and Hartwig Voss, both of Hannover, Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany**

**Filed Feb. 23, 1972, Ser. No. 228,510**

**Claims priority, application Germany, Feb. 24, 1971, 2108694**

**Int. Cl. B61f** *5/10*; **F16f** *9/04*, *9/54*

**U.S. Cl. 267—3** **1 Claim**



1. For use in connection with a rail vehicle having a vehicle body and bogie including an upright supporting body and also having two abutment rings respectively fixedly connected to said vehicle body and on said upright supporting body on said bogie and spaced below the top of said body, an air spring bellows for hanging insertion between and connection to said abutment rings, which includes in combination: a hollow body of revolution of elastomeric material which cross-sectionally has a continuous curvature displaced in small increments, said hollow body having a first opening defined by a first annular bead integral with said hollow body for connection to one of said abutment rings, and also having a second opening opposite said first opening and defined by a second annular bead integral with said hollow body for connection to the other one of said abutment rings, two bead core rings respectively embedded in said first and second beads, strength members extending linearly in force direction first radially and then axially from bead to bead to take up freely forces without bending away with a load of the core ring, one of said beads having a shorter diameter than the other bead mounted on said upright supporting body and resting on the abutment ring on said body, the core ring embedded in the shorter diameter bead having an internal diameter less than the diameter of said abutment ring on said body and an external diameter exceeding the outer diameter of said abutment ring on said body, the free ends of said strength members in said shorter diameter bead being folded lying over said last mentioned bead on that side thereof which faces in the direction toward the abutment ring to which said smaller diameter bead is to be connected, said strength members being bonded to the respective adjacent bead ring, the free ends of said strength members after being looped around the pertaining beads extending in groups into the wall of said bellows, said wall extending downwardly from said smaller diameter bead, the said strength members differing from each other in length and having their free ends arranged to be staggered.

3,895,788

## SUSPENSION DEVICE PARTICULARLY FOR PIPES

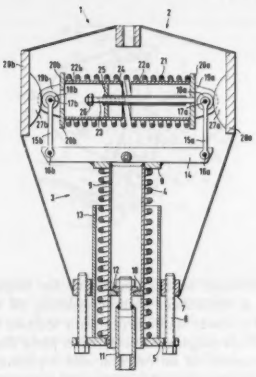
Gerhard Liesegang, Zeven-Aspe, Germany, assignor to Lisega Rohrleitungszubehor GmbH, Zeven-Aspe, Germany

Filed Feb. 11, 1974, Ser. No. 441,213

Claims priority, application Germany, Feb. 10, 1973, 2306674

Int. Cl. F16f *1/26*

U.S. Cl. 267—70 12 Claims



1. A spring suspension device comprising means for biasingly suspendingly supporting an element, said last-mentioned means including a main suspension spring, means disposed transversely of said main suspension spring for compensating for variations in tractive or compressive forces of the main suspension spring, said compensating means including a pair of spaced cams having opposed convex cam surfaces, a pair of tubes having aligned axes disposed between said cam surfaces, a cam follower carried by each tube in rolling contact with an associated cam surface, common guide means for maintaining said tubes in axially aligned relationship, and a single spring for biasing said tubes and the cam followers carried thereby toward the associated convex cam surfaces.

3,895,789

## ROTATABLE QUICK-ACTING AXIAL PRESSURE ABSORBING CHUCK FOR A CIRCULAR WELDING MACHINE

Max Mengeringhausen, Wurzburg; Hermann Quenzel, Lengfeld; Reinhold Gehrig, Retzstadt, and Willi Spanheimer, Waldbuttelbrunn, all of Germany, assignors to Mero AG, Wurzburg, Germany

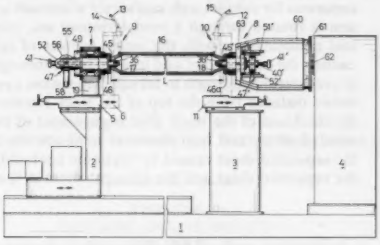
Filed Aug. 6, 1973, Ser. No. 385,678

Claims priority, application Germany, Aug. 18, 1972, 2240613

Int. Cl. B23q *3/14*

U.S. Cl. 269—49 4 Claims

1. A rotatable axial pressure absorbing quick-acting chuck for a circumferential welding machine for producing rod elements having an end member with a central bore comprising a bearing block, a clamping bush with a central bore mounted for rotation in said bearing block and fixed against axial movement relative thereto, a clamping stud having a cylindrical bearing section connected for axial movement in the central bore of said clamping bush, a screw cap having a central aperture threadably connected to one end of said clamping bush, said screw cap having an external end face forming a transverse-axial contact surface for an end member, a reduced diameter stud portion on one of said clamping stud extending through the central aperture of said screw cap and adapted to extend through the central bore of an end member, radially extensible and retractable clamp means connected on said reduced diameter stud portion and adapted to engage the interior of an end member when extended, and eccentric displacement means connected to the opposite end of said clamping stud to move said clamping stud axially and adapted to retain an end member placed on said reduced diameter stud against said transverse-axial contact surface when said clamp means is radially extended, removable bolt means connecting said eccentric displacement means to said clamping stud for releasably connecting said eccentric displacement means to said clamping stud; the central bore of said clamping bush



selectively receiving one of a plurality of interchangeable clamping studs, each stud having a cylindrical bearing section of the same diameter for connection in the central bore of said clamping bush, and each clamping stud having a reduced diameter stud portion of a different size for extending through and engaging a respective end member from a plurality of end members of varying sizes having central bores of different sizes, whereby chucks of different sizes corresponding to the sizes of the respective end members to be welded to the rod element may be rapidly interchanged on said welding machine.

3,895,790

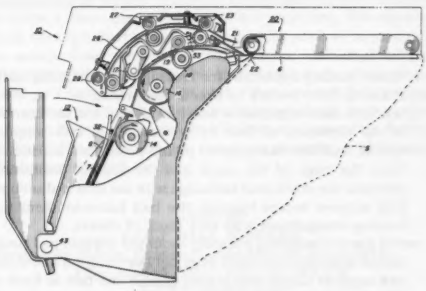
## MOVABLE BAIL BAR

August Hoyer, Penfield, and Ronald M. Nekula, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 19, 1973, Ser. No. 380,803

Int. Cl. B65h *3/54*

U.S. Cl. 271—10 5 Claims



1. Apparatus for separating and feeding individual sheets of material from a stack of sheet material comprising:

separator means adapted for frictional engagement with the bottom sheet in the stack to displace the sheet in a direction parallel to the plane of the sheet;

bail means adapted for engagement with the top of the stack, said bail means including biasing means to bias said bail against the stack to provide a force normal to the plane of the sheet for maintaining the bottom sheet of the stack in frictional engagement with said separator means;

feed means for engaging and feeding the separated sheets away from the stack;

lever means pivotally mounted on said apparatus for engagement with said bail means, pivotal movement of said lever means causing said lever means to lift said bail means from said stack, said lever means including a lever having an arcuate sector formed on one end thereof, the other end of said lever being adapted for contact with said bail means;

biasing means for maintaining said lever in contact with said bail means irrespective of the thickness of the stack of sheet material under said bail means; and,

actuating means including an arm pivotally mounted on said apparatus for contact with said sector when said actuating arm is rotated through a predetermined arc, contact of said actuating arm with the sector portion of said lever causing the other end of said lever to move through an arc of predetermined length to lift said bail means a predetermined distance from the top of the stack irrespective of the thickness of the stack after engagement of the separated sheet by said feed means to minimize the drag on the separated sheet caused by frictional contact between the separated sheet and the adjacent sheet in the stack.

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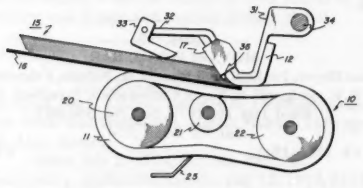
## 3,895,791
## BOTTOM SHEET FEEDER USING SEPARATION BELT AND RETARD PAD

**Hans P. Kramell, Perry, and Richard C. Hansen, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 19, 1973, Ser. No. 342,653**
**Int. Cl. B65h** *3/04*
**U.S. Cl. 271—35** **1 Claim**



1. Sheet feeding apparatus for feeding and separating individual sheets from a stack of sheets comprising

an endless sheet separation belt including a section carried in the direction of feed by at least three belt support means, said first belt support means positioned a distance from the edge of the stack and the second positioned opposite the stack near said edge with the first and second belt support means locating the belt between them for feeding engagement with said stack of sheets,

retard means including a fixedly mounted friction pad positioned adjacent said stack edge between second and third belt support means and biased against the belt to form a sheet queuing throat, and

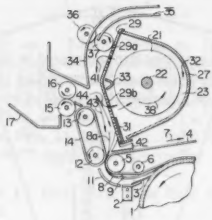
an infeed chute adjacent said retard means and angled relative to the stack to slope the sides of the stack to create a normal force between the stack and a region of the belt adjacent the second belt support means,

said retard means and said infeed chute being carried by a cantilever member fixedly mounted to bias the retard means and belt against one another, said cantilever member extending over the stack of sheets and including a weight pivotally coupled thereto for exerting a force on the last few sheets in the stack requiring a simulation of stack weight for feeding engagement with the separation belt.

## 3,895,792
## AUTOMATIC SEPARATION DEVICE FOR COPYING APPARATUS

**Tokuzo Kaneda, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Oct. 29, 1973, Ser. No. 410,530**
**Claims priority, application Japan, Nov. 15, 1972, 47-115040**
**Int. Cl. B65h** *29/64*
**U.S. Cl. 271—172** **1 Claim**



1. An automatic separation device for copying apparatus comprising a ventilation plate consisting of an upper half portion and a lower half portion and formed therein with a multitude of openings, said ventilation plate disposed along a path of movement of an original and a photosensitive sheet released in superposed relationship from an exposing station with the photosensitive sheet being disposed nearer to the ventilation plate, a cross-flow blower adapted to set up a flow of fluid moving out of the interior of the blower through an outlet region thereof in which said upper half portion of said ventilation plate is disposed into said path through said openings in said upper half portion of said ventilation plate, and means for causing said outgoing flow of fluid to change its direction of movement after passing through said openings in said upper half portion of said ventilation plate and move downwardly along said path toward the inlet of the path, a part of said downwardly moving flow of fluid introduced through said openings in said lower half portion of said ventilation plate disposed in an inlet region of the blower into the interior thereof and the rest of said downwardly moving flow of fluid moving toward opposite sides of said path.

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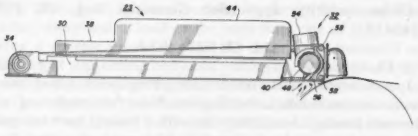
## 3,895,793
## VACUUM SHEET STRIPPER

**John J. Bigenwald, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 20, 1973, Ser. No. 427,009**
**Int. Cl. B65h** *29/56*
**U.S. Cl. 271—174** **4 Claims**

4. A method for removing an electrostatically tacked transfer member from a moving image support member in a reproduction machine including the steps of:

drawing a plurality of streams of air into vacuum ports adjacent the lead edge of the transfer member, substantially all of the air being drawn in a direction substantially opposite to the direction of the moving transfer member to separate the transfer member from the image support member; and

transporting the separated transfer member away from the image support member.

## 3,895,794
## ROLLABLE FULCRUM BALANCING BOARD RECREATIONAL AND EXERCISE DEVICE PROVIDED WITH NON-LINEAR STABILIZATION FEATURES

Will Clarke England, 7310 Eastcrest Dr., Austin, Tex. 78752

Division of Ser. No. 83,763, Oct. 26, 1970, Pat. No. 3,862,768.
This application Aug. 15, 1973, Ser. No. 388,362
Int. Cl.[2] A63B 23/04
U.S. Cl. 272—1 R 4 Claims

1. A teeter-totter balancing recreational device provided with non linear stabilization features comprising:

A. a cylindrical shaped fulcruming roller having a uniform diametral cross-section from end to end of the roller and adapted to roll across a horizontal surface;

B. a rigid elongated non-linear balancing board adapted to cover and ride on said cylindrical roller and having

1. a uniform width slightly greater than the length of the cylindrical shaped fulcruming roller with which it must coact,

2. a length approximating the distance from the heel to the hip joint of the rider for whom the balancing device is designed, having

a. a protuberant center portion occupying about two-thirds of the length of said balancing board, and

b. upturned ends forming a foot positioning trench at either end of said balancing board,

3. vertical side wall boards extending along each side of the protuberant center portion of said balancing board; and

C. the undersurface of said protuberant center portion of said balancing board defining a long arc concave surface gently sloping away from the apex of the concave enclosure to form motion slowing surfaces.

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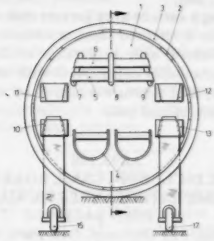
## 3,895,795
## BASE PLATFORM SPORT AND GYMNASTIC APPLIANCE WITH SELECTIVELY CONNECTIBLE ADDITIONAL COMPONENTS

Christof Merz, Schoppershofstr. 75, 8500 Nurnberg, Germany

Filed Apr. 6, 1972, Ser. No. 241,575
Claims priority, application Germany, Apr. 6, 1971, 2116657; Mar. 20, 1972, 2212443
Int. Cl. A63b 23/00
U.S. Cl. 272—57 J 5 Claims

1. A sport and gynmastic appliance comprising a circular base platform having opposite surfaces, holding means on one of the surfaces for the feet of the user so that when the feet are positioned in the holding means, the user's body is substantially normal to the major plane of the base platform, further means on said one surface spaced from said holding means for permitting the selective connection of additional components to the base platform, a ring of greater diameter than the base platform secured to and spaced laterally from said one surface and on which ring the base platform can turn when the base platform is in a vertical position, one additional component including two rollers having their axles located coaxially to each other and parallel to the major plane of the base platform, so that with the base platform in a vertical position and being in engagement with a bearing member at substantially the center of the other surface of the base platform, the base



platform can be tilted forwardly and rearwardly by virtue of the rollers.

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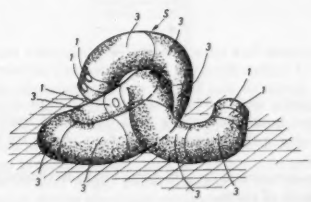
## 3,895,796
## TOY AND SPORTS DEVICE

Iwan Pestalozzi, Zollikerstrasse 1221, Binz, Switzerland

Filed Dec. 18, 1973, Ser. No. 425,767
Claims priority, application Switzerland, Dec. 21, 1972, 18636/72
Int. Cl. A63b 9/00
U.S. Cl. 272—60 R 18 Claims



1. A toy- and sporting device comprising a set of individual interconnectable tubular elements of substantially circular cross-section, at least some of these tubular elements being constructed as arcuate elements, connected together in series to form a three-dimensionally coiled structure, the connections between the tubular elements being such as to maintain an axially fixed relationship between the individual tubular elements while permitting the individual tubular elements to undergo rotation relative to each other around their respective axes so that upper situated tubular elements bear against tubular elements situated therebelow, said elements having distinct ingress and egress openings whereby a child may climb therethrough.

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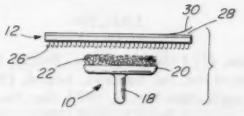
## 3,895,797
## GOLF BALL MARKER

Harrington Moore, Hidden Harbor, Stuart, Fla. 33494

Filed July 17, 1974, Ser. No. 489,270
Int. Cl. A63b 57/00
U.S. Cl. 273—32 A 2 Claims



1. A golf ball marker and holder, comprising in combination

a. a substantially flat disc,

b. a peg extending perpendicularly from one face of said disc,
c. a stratum of fibrous felt material bonded to the other face of said disc, and,
d. a pad having a surface area greater than that of said disc mountable to a selected support surface and formed on one face thereof with a plurality of flexible, resilient hooks for detachable engagement with said fibrous material and a layer of pressure sensitive adhesive material on the other face of said pad.

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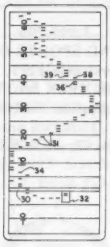
**3,895,798**

## GAME DEVICE INCLUDING GAME BOARD AND PUNCH CARDS FOR SIMULATING ATHLETIC GAMES SUCH AS FOOTBALL

**Clifford J. Collins, 812 Highland, Oak Park, Ill. 60304**

**Filed Sept. 17, 1973, Ser. No. 397,667**
**Int. Cl. A63f** *9/14*
**U.S. Cl. 273—85 R** **11 Claims**



1. A game device including in combination:
a game board defining a field of play as used in a game involving the advancement of an object on the field of play,
means positioned on said game board to record thereon the results of plays,
a multiplicity of punched playing cards each having a mark thereon representing the position at which play starts,
a first plurality of said cards being offensive cards each having a plurality of punches therein positioned to represent the position and movement of the object on said game board for a particular play, and
a second plurality of said cards being defensive cards each having a plurality of punches therein positioned to represent the positions of defensive players during a particular play,
the alignment of a punch on a selected defensive card with a punch on a selected offensive card when either said offensive card is in aligned position over said defensive card or said defensive card is in aligned position over said offensive card indicating the result of the play to be recorded on said game board,
the punches in said offensive cards being positioned so that the plays closely simulate plays used in a game involving advancement of an object on the field of play and the punches in said defensive cards being positioned so that the possibility of success of the play is substantially the same as in such game.

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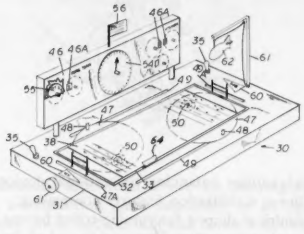
**3,895,799**

## SPORTS GAME

**Erik K. Rinne, 4311 Bordeaux Ave., Dallas, Tex. 75205**

**Continuation of Ser. No. 168,891, Aug. 4, 1971, abandoned.**
**This application Nov. 2, 1973, Ser. No. 412,426**
**Int. Cl. A63f** *3/00*
**U.S. Cl. 273—85 R** **8 Claims**

7. A game comprising: a game board having means defining a window opening; a surface traversing said opening which is at least translucent to light; a light source connected beneath said game board for transmitting light through said window surface; sheet means positioned over said surface, said sheet means having a readily erasable writing surface; fixed indicia means formed on said sheet means to define a plurality of playing obstacles; means for indicating simulated wind conditions; a series of distance-indicating members calibrated in accordance to varying simulated wind conditions to indicate various distances of play during the play of the game; adjustably positionable indicia means disposed beneath said sheet, said adjustably positioned indicia means being normally obscured until said light source is energized; and a marking stylus for drawing an erasable line on the writing surface of said sheet.



8. A game comprising: a game board having a cut-out portion defining a window opening; a surface traversing said opening which is at least translucent to light rays; a light source connected beneath said game board for transmitting light rays through said window surface; sheet means positioned over said surface, said sheet means having a readily erasable writing surface, a fixed indicia means formed on said sheet means to define a non-erasable playing obstacle, adjustably positionable indicia means disposed beneath said sheet, said adjustably positionable indicia means being normally obscured until said light source is energized; means to mount said adjustably positionable indicia means for longitudinal and rotational movement relative to said playing field; and a marking stylus for drawing an erasable line on the writing surface of said sheet.

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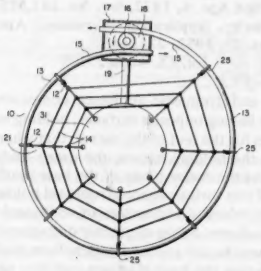
**3,895,800**

## PROJECTOR AND CATCHER WITH VARIABLE TARGET OPENING

**Toni B. King, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest**

**Filed Sept. 3, 1974, Ser. No. 502,515**
**Int. Cl. A63b** *71/00*
**U.S. Cl. 273—96 R** **4 Claims**



1. A game apparatus for catching an object in a closable net, comprising

a flexible circular net mounted at its bottom to a flat plate, with the top of the net slidably mounted to rim formed as a split ring,

a handle member anchored at one end to said flat plate, and means controllable from the handle to open or close the rim of the net by moving the ends of the split ring forming the rim.

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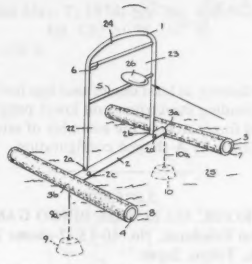
**3,895,801**

## SKIPPING PROJECTILE WATER TARGET

**Barbara Baird, Apt. 809, 808 W. End Ave., New York, N.Y. 10025**

**Filed July 20, 1973, Ser. No. 381,242**
**Int. Cl. A63b** *71/02*
**U.S. Cl. 273—95 R** **1 Claim**



1. Apparatus for playing a game of skipping projectiles on a body of water such that the projectiles richochet off the water and then pass through a target comprising, a target which includes an H-shaped base member enabling said target to float on the water, an arch-shaped upright member attached at its open ends to the cross bar of said H-shaped base member such that the plane containing said upright member intersects the plane of the surface of the water at substantially right angles thereto, and one or more cross pieces placed within and attached to said arch-shaped upright member substantially parallel to and at different vertical distances from the cross bar of said H-shaped member, said H-shaped base member, said arch-shaped upright member and said cross pieces being readily detachable from and reattachable to each other; and one or more disc-shaped projectiles adapted to skip off the water when directed at the water at a suitable angle thereto, such that said projectiles pass completely through the plane containing said upright member after skipping off the surface of the water.

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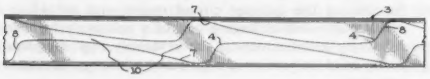
**3,895,802**

## IMITATION FEATHER FLETCHING AND METHOD OF MAKING SAME

**Fred B. Bear, Grayling, Mich., assignor to Victor Comptometer Corporation, Chicago, Ill.**

**Continuation of Ser. No. 248,019, April 27, 1972, abandoned. This application Oct. 16, 1973, Ser. No. 406,961**
**Int. Cl. F41b** *5/02*
**U.S. Cl. 273—106.5 C** **3 Claims**



1. A strip of synthetic resinous material for manufacture of a plurality of vane members for an archery arrow comprising: an elongated central web portion of substantially constant thickness, having a pair of transversely spaced parallel side portions,

a first elongated base flange portion extending along one of said side portions,

a second elongated base flange portion extending along the other of said side portions,

said first side flange portion and said second side flange portion each having a flat abutment surface which is wider than the thickness of said web portion for attachment to the shaft of an arrow, and

said web portion having two score lines each defining a series of longitudinally spaced vane members integral with one of said base portions.

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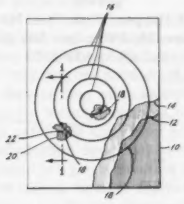
**3,895,803**

## LAMINAR INDICATING TARGET

**James M. Loe, 27 School Ln., Willow Grove, Pa. 19090**

**Filed Aug. 22, 1973, Ser. No. 390,584**
**Int. Cl. F41j** *1/02*
**U.S. Cl. 273—102 R** **11 Claims**



1. A target comprising substrate means and target pattern means formed on one side of said substrate means in a layer substantially covering said one side of said substrate means, said substrate means and said target pattern means being mutually contrasting visually, said substrate means and said target pattern means being arranged such that when struck by a high speed projectile, a substantially larger-than-projectile-size portion of said target pattern means at the projectile's point of impact will be physically separated and removed from the rest of said target pattern means, and a hole, of a size smaller than said removed portion of said target pattern means, will be made in said substrate means, whereby a portion of said substrate means around said hole will be exposed by the impact of said projectile.

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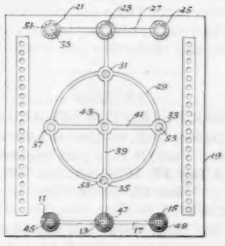
**3,895,804**

## GAME APPARATUS

**Elizabeth Anna Lee, 39 Fox Hunt Ln., Amherst, N.Y. 14226**

**Filed Mar. 12, 1973, Ser. No. 340,114**
**Int. Cl. A63f** *3/00*
**U.S. Cl. 273—131 AD** **12 Claims**



1. A fast playing game, suitable for enjoyment of the young as well as by older persons, which tests mental faculties and yet is amusing to the players, which comprises a marked game playing surface having a plurality of home base positions in

each of a plurality of separate home bases marked for initial placement of at least three game pieces, one at each of at least three positions at each home base, a plurality of stop positions, arranged in a single circuit, at least one connecting path between stop positions that are on the circuit, said path having a stop position on it, a single path only, for each home base, connecting only one home base position to the circuit, for each home base, a plurality of game movers adapted to be moved along on the respective single paths from the initial bases to the circuit and along the circuit and the connecting path, when desired, said pieces comprising at least three pieces for each player and the number of pieces being such that it is possible to have the stops on the circuit and the connecting path(s) occupied by the pieces of a player or a plurality of players so that another player cannot move any of his pieces to an adjacent unoccupied stop position on the circuit or connecting path.

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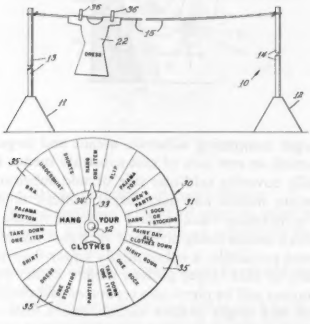
**3,895,805**
**GAME**
**Madge I. Enos, 337 Harper, Watervliet, Mich. 49098**
**Filed Nov. 26, 1971, Ser. No. 202,135**
**Int. Cl.[2] A63F** *3/00*
**U.S. Cl. 273—135 F** **4 Claims**




1. A game comprising at least one clothesline and means for supporting same in substantially horizontal position above a horizontal surface comprising a pair of support bases adapted to rest in equilibrium on a flat horizontal surface, and a pair of poles each affixed at one end to one of said support bases, the ends of said clothesline being affixed to the other ends of said poles, a plurality of playing pieces simulating articles of wearing apparel, means for affixing each article of wearing apparel to said clothesline in such manner that said article of wearing apparel hangs suspended from said clothesline, and a spinner assembly comprising a base, a pivot pin vertically mounted with respect to said base having an indicating pointer at one end pivotally mounted on said pivot pin, said base being divided into sectors each providing instructions for adding to or removing from said clothesline one or more playing pieces.

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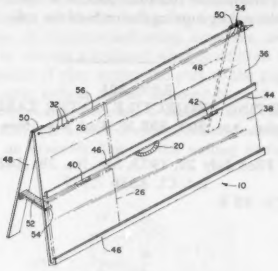
**3,895,806**
**HOLDER BOARD FOR BINGO GAMES**
**John J. Burns, Ogden, Utah, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest**
**Filed July 15, 1974, Ser. No. 488,462**
**Int. Cl.[2] A63F** *3/06*
**U.S. Cl. 273—136 E** **2 Claims**

1. A holder for bingo cards and the like, comprising in combination: upper and lower panels hinged along their contiguous longitudinal edges and foldable on one another; a tongue and groove assembly extending along substantially the entire length of the lower portion of each of said panels for receiving and holding said cards therein; a wire for carrying bingo markers, said wire being secured to the upper part of said upper panel; a pair of legs of equal length for supporting said panels at an angle from the horizontal during use; snap-on hinges on the top of said upper panel for removably securing said legs thereto; at least one of said legs having a positioning finger extending therefrom; said lower panel having a slot receiving said finger to hold the assembly of said legs and said panels in a generally A-shaped configuration.



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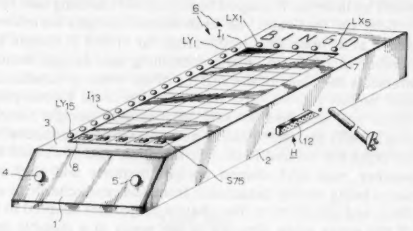
**3,895,807**
**ELECTRONIC SELECTION BINGO GAME UNIT**
**David Warren Friedman, No. 30-15, 2-chome Kakinokizaka, Meguro-ku, Tokyo, Japan**
**Filed Aug. 9, 1973, Ser. No. 387,194**
**Claims priority, application Japan, Jan. 23, 1973, 48-9151**
**Int. Cl. A63b** *71/06;* **A63f** *3/06*
**U.S. Cl. 273—138 A** **6 Claims**




1. An equal probability selection electronic device for a bingo game allowing a human operator to make, by successive operation, the selection of any one of 75 (or fewer, if some are not selectable) unique selection intersections, comprising:
a switch matrix comprised of 75 slide switches arranged in a 5 × 15 Cartesian coordinate form, each slide switch being used to indicate a selection intersection and being individually controllable by the operation of the human operator to define whether or not the slide switch is selectable and lamp indicators operatively positioned to define the intersection selected at the time of selection;
a selector circuit coupled to said switch matrix and comprised of counter circuit means for successively addressing the slide switches;
clock circuit means coupled to said counter circuit means for driving the counter circuit means and providing a clock pulse output having one of a relatively high and relatively low frequency, the relatively high frequency being used only to sweep past any addresses previously selected;
feedback circuit means connected between the switch matrix and the clock circuit means for controlling said clock pulse output such that the clock pulse output is selected to be of low frequency when a selectable slide switch is being addressed and is otherwise selected to be of high frequency; and

selection start switch means arranged to provide, by successive operator use for each desired selection, both a start signal to the clock circuit means for initiating a selection of a slide switch and a stop signal for initiating termination of a selection cycle, the arrangement being such that the clock pulse output may be stopped only when a selectable slide switch is addressed, which occurs at equal time segments of the addressing sequence, regardless of the number of slide switches no longer selectable.

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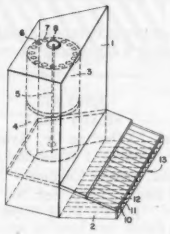
## 3,895,808
## SELECTING DEVICE

**Beauford E. Averette, Vancouver, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest**

**Filed Mar. 7, 1974, Ser. No. 448,902**
**Int. Cl.² A63F 7/02**
**U.S. Cl. 273—138 R** **5 Claims**



1. A playing element drop chance selecting device, comprising

a base supporting an upstanding closed housing;

a plurality of substantially coaxially aligned upstanding cylinders mounted within the housing, each of the cylinders being independently rotatably mounted for rotation about its axis;

a plurality of substantially vertically aligned holes through the top and bottom ends of the housing, the holes being substantially equianguarly arranged in a circular array;

means in the housing whereby the cylinders may be individually rotated;

index means for each of the cylinders, each of the cylinders having a plurality of openings in the top and bottom surfaces thereof corresponding to the vertically aligned holes in the housing at any indexed position of the cylinders;

a plurality of ducts in each of the cylinders connecting the top and bottom openings of each respective cylinder, with no duct connecting the top opening of a cylinder to the bottom opening positioned directly below it;

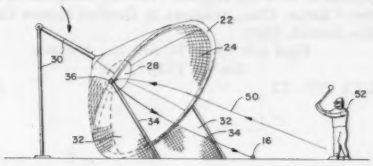
a plurality of channels in the base, one end of each channel underlying a respective hole in the bottom of the housing; and

a playing element adapted to be dropped through any one of the top housing holes after the cylinders have been rotated and indexed whereby the discharge of the playing element into one of the underlying channels is dependent upon its gravity travel through the ducts of the cylinders as chance indexed with respect to each other.

## 3,895,809
## BALL RETURN DEVICE

**Charles Glenn Shockley, Peekskill, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest**

**Filed Aug. 19, 1974, Ser. No. 498,437**
**Int. Cl.² A63B 69/36**
**U.S. Cl. 273—182 R** **5 Claims**



1. A ball return device particularly adapted for use in practicing the game of golf comprising:

a. a circular loop fabricated from at least two sections of metallic tubing whereby each section represents a portion of the periphery of said loop, each section further including means for inserting one section into the other to form a composite circular loop when assembled,

b. a concave canvas member coupled to the periphery of said loop and extending therefrom to form a generally parabolic configuration dimensioned to cause a golf ball impinging thereon in a given direction to return to a point of origin, said canvas member further having a central portion serving as a reflector plate and adapted to return balls which impinge directly thereon.

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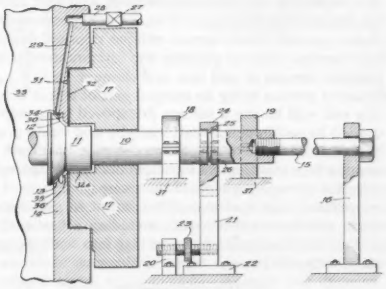
## 3,895,810
## MECHANICALLY ACTUATED TEMPORARY PUMP SHAFT MAINTENANCE SEAL

**Judson S. Swearingen, San Antonio, Tex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.**

**Filed Mar. 15, 1948, Ser. No. 14,858**
**Int. Cl. F16j 9/00**
**U.S. Cl. 277—9 SR** **3 Claims**



1. A temporary closure for a rotatable shaft passing through a wall of a housing comprising means defining a conical surface extending through said wall, an annular groove in said wall dividing the conical surface into an inner part, and an outer part, means for admitting gas under pressure to said annular groove, a conical collar on said shaft arranged to form a closure with said inner part of the conical surface only, tensioning means externally of the housing for applying axial tension on said shaft to bring said collar into sealing contact with said inner part, and clamping means engageable with the

shaft and arranged to maintain the closure when said tensioning means are released.

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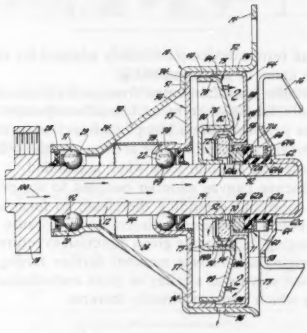
**3,895,811**

## FACE SEALING ARRANGEMENT FOR AUTOMOTIVE WATERPUMPS AND THE LIKE AND FACE SEAL ASSEMBLY THEREFOR

**Raymond L. Richard, Jr., and Peter M. Sampatacos, both of Port Clinton, Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed July 19, 1974, Ser. No. 490,066**
**Int. Cl. F16j** *15/40*
**U.S. Cl. 277—22** **1 Claim**



1. A face sealing arrangement for an automotive waterpump or the like having a rotatable impeller shaft protruding through an opening in a housing end wall, comprising in combination:

an inner sleeve portion integral with said housing end wall and coaxial with said hole through which said impeller shaft protrudes,

an annular face seal element of low tensile strength material having outer beveled ends securely mounted in said sleeve portion and radially spaced from said shaft,

heat conductive means producing circumferential compressive stresses in said face seal element, said heat conductive means including spaced frustoconical portions of said sleeve portion which impart oblique opposed forces to said beveled ends to produce the circumferential compressive stresses in said face seal element,

said sleeve portion being an integral part of a heat conductive end wall having a surface juxtaposed to an impeller carried by said impeller shaft whereby said sleeve portion and said end wall are adapted to dissipate heat from said annular face seal element into fluid being pumped by said impeller during operation of the pump, and

a cooperative face seal assembly secured to said impeller shaft, said face seal assembly including a face seal ring and means biasing said face seal ring into sealing engagement with said annular face seal element.

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**3,895,812**

## BI-METALLIC SEAL

**Hugh Harr, Jr., High Point Farm, Newtown, Pa. 18940**

**Filed Jan. 21, 1974, Ser. No. 435,195**
**Int. Cl. F16j** *15/08*
**U.S. Cl. 277—32** **4 Claims**

1. In a seal between adjacent first and second members, the combination of

A. a bi-metallic sealing strip of elongate construction,

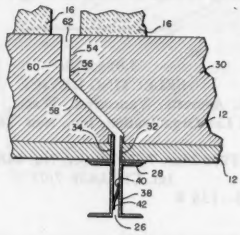
1. said strip having one elongated fixed edge and one elongated sealing edge,

a. said free edge having an initial position,

2. said fixed edge being affixed to the first member,

3. said sealing edge flexing outwardly from the initial position when the members are subjected temperature differential,

4. said sealing edge assuming a final position against the second member when the members are subjected to the



temperature differential to thereby establish the seal; and

B. a first member comprising the rear bumper of a kiln car and the second member comprises the front bumper of a kiln car,

1. the front and rear bumpers being in horizontal alignment to define a transverse junction.

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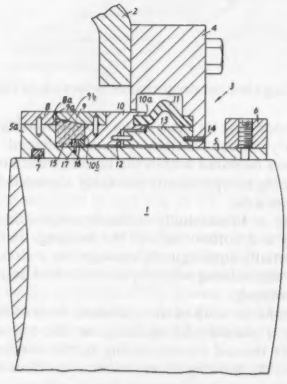
**3,895,813**

## SHAFT SEAL

**John Kyffin Davies, 22 Darlton Dr., Arnold, Nottingham, and Bernard Victor Cadman, 1 Woodside Ave., Berryhill Mansfield, Nottingham, both of England**

**Filed Dec. 3, 1973, Ser. No. 421,347**
**Int. Cl. F16j** *15/36*
**U.S. Cl. 277—88** **7 Claims**



1. A seal assembly for use in sealing an aperture in a containing wall through which a rotatable shaft passes, comprising a primary face seal constituted by a first ring member fixedly securable to the shaft in a liquid tight fashion for rotation therewith and a second ring member fixedly securable in a liquid tight fashion to the wall about the aperture therein, the ring members being provided on opposed faces with cooperating annular sealing surfaces which are of hard material having a hardness of at least 82 on the Rockwell B scale, and which have at least substantially the same wear characteristics, said surfaces being, in use, in light contact to form a barrier to the passage of solid matter therepast but to permit the passage of an amount of liquid, and at least one secondary

face seal operable between the wall and the shaft which comprises a rotatable sealing member securable to the shaft and a non-rotatable sealing member securable to the container wall, one of said sealing members having a sealing surface of hard material and the other a sealing surface of relatively soft material, these surfaces being in relatively firm contact to form a barrier to the passage of said amount of liquid.

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**3,895,814**

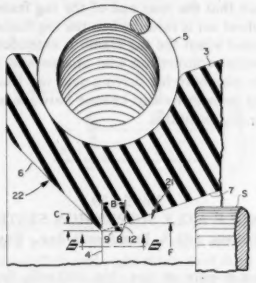
## ROTARY SHAFT SEAL

**Bernard F. Kupfert, Peoria, Ill., and Gerald J. Bailey, Lexington, Ky., assignors to Parker-Hannifin Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 170,426, Aug. 10, 1971. This application Oct. 3, 1973, Ser. No. 403,049**

**Int. Cl.² F16J** *15/40*

**U.S. Cl. 277—134** **4 Claims**



1. In combination, a seal and a rotatable shaft of predetermined diameter, said seal comprising a ring of elastomeric material having converging faces meetings at a circumferentially continuous circular edge that is in contact with said shaft about the circumference thereof and which edge may have a minor imperfection that permits leakage of fluid along said shaft from one side of said edge to the other, the face that is on said other side of the edge having thereon a single circumferential series of radially inwardly projecting portions whose largest radial height is about 0.004 inch, each projection having at least one side that converges toward said edge and which constitutes a pumping element that is operative during rotation of the shaft when the seal is mounted thereon and pumps said leakage fluid from said other side of said edge back to said one side; the largest diameter across said projecting portions when the seal is not on the shaft being substantially as large as the largest diameter across said imperfection but smaller than said pre-determined diameter, said elastomeric material being wearable by the rotating shaft whereby said imperfect edge will be worn away followed by a complete wearing away of the projecting portions, such wearing away of the edge and projecting portions resulting in a flat, smooth cylindrical surface of substantially uniformed axial length whose diameter when the projecting portions have just worn away and the seal is removed from the shaft is smaller than the diameter of the shaft.

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**3,895,815**

## SEALING ASSEMBLY

**Pier Luigi Panigati, Lugano, Switzerland, assignor to Etablissements d'Occident, Vaduz, Liechtenstein**

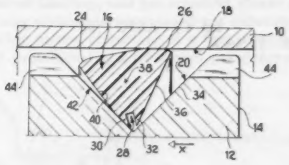
**Filed Feb. 4, 1974, Ser. No. 439,433**

**Claims priority, application Switzerland, Feb. 9, 1973, 1884/73**

**Int. Cl.² F16J** *15/32, 15/40*

**U.S. Cl. 277—171** **5 Claims**

1. In an assembly comprising first and second relatively movable coaxial cylindrical bodies having opposed first and second cylindrical surfaces respectively, a sealing device comprising diverging flanks defining a V-shaped annular chamber, opening into said first cylindrical surface, a tip of said annular chamber formed at the junction of said flanks, a sealing ring of substantially triangular cross-section located in said annular chamber, two diverging sidewalls of said sealing ring diverging at an angle less than the angle of divergence of the flanks of the annular chamber, whereby the sealing ring is tiltable from



a rest position about said tip of said annular chamber, and a third wall of said sealing ring in opposed facing relationship to said second cylindrical surface, said third wall being spaced from said second cylindrical surface in said rest position of said sealing ring and sealingly contacting said second cylindrical surface only in a tilted position of said sealing ring.

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**3,895,816**

## VEHICLE-ATTITUDE CONTROL DEVICE

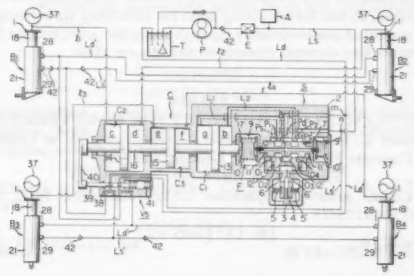
**Noriyuki Takahashi; Hiromitsu Miyahara, both of Tokyo, and Hidehiko Inoue, Oimachi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 8, 1974, Ser. No. 449,468**

**Claims priority, application Japan, Mar. 12, 1973, 48-28783**

**Int. Cl.² B60G** *13/08*

**U.S. Cl. 280—6 H** **10 Claims**



1. A vehicle-attitude control device for an automotive vehicle having a frame and wheels, said device comprising: centrifugal force sensing means operable to produce an output signal upon sensing a centrifugal force occurring when the vehicle travels along a curved course; telescopic shock absorbers arranged in left and right pairs between the frame and respective wheels of the vehicle; means operable upon reception of said output signal to controllably increase and decrease the amount of fluid in the left and right pairs of said shock absorbers thereby to tilt the vehicle frame laterally in a direction opposite to the direction of lateral swing ordinarily occurring under the action of said centrifugal force; vehicle-height controlling valve means associated with said respective shock absorbers and each operable to feed the associated shock absorber with pressure fluid upon contraction thereof below a predetermined length and to cause fluid exhaust from the associated shock absorber upon extension thereof above a predetermined length; and means operable to automatically render said vehicle-height controlling valve means ineffective upon operation of said centrifugal force sensing means.

## 3,895,817
## SAFETY SKI BINDING

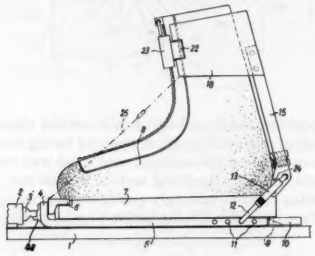
**Ernst Gertsch, Wengen, and Ulrich Gertsch, both of Interlaken, Switzerland, assignors to Gertsch AG, Interlaken, Switzerland**

**Continuation-in-part of Ser. No. 87,404, Nov. 6, 1970, Pat. No. 3,753,571. This application Apr. 13, 1973, Ser. No. 350,754**

**Claims priority, application Switzerland, Nov. 10, 1969, 016697/69**

**Int. Cl.[2] A63C 9/08**

**U.S. Cl. 280—11.35 K** **4 Claims**



**1.** In a safety ski binding for a ski, a release plate having a lengthwise axis, a reinforcement element, means for mounting said element on said release plate for pivotal movement about an axis extending substantially transversely with respect to the lengthwise axis of said release plate, said element having a length such that said element extends along the upper of an associated ski boot to a point at least above the ankle joint of the skier's leg, means for placing the element in contact with the skier's leg for movement therewith, and means for locking said element in a predetermined position of pivoting motion thereof, so that forces acting upon the skier's leg are no longer transmitted predominantly through the ankle joint, but via the thus locked element directly to the release plate.

## 3,895,818
## SUPPLEMENTARY WHEEL SET FOR ROAD VEHICLES

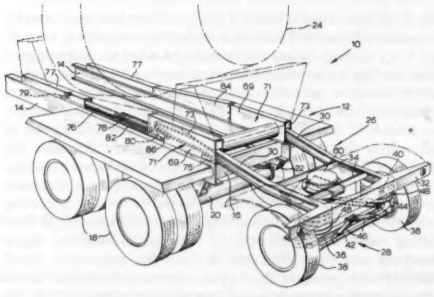
**Robert L. Fearon, Edmondton, Canada, assignor to London Concrete Machinery Co., London, Canada**

**Filed June 3, 1974, Ser. No. 475,443**

**Claims priority, application United Kingdom, Sept. 13, 1973, 43175/73**

**Int. Cl.[2] B60S 9/22**

**U.S. Cl. 280—81 R** **11 Claims**



**1.** In a road-going vehicle having rear wheel sets supporting a chassis, the improvement of

a. a tag frame supporting a tag wheel set rearwardly of said chassis, the frame having longitudinal beam means including intermediate beam portions and forward ends;

b. mounting means on said chassis for mounting said tag frame beam means for longitudinal movement with respect to said chassis between a retracted position where the tag wheel set is closely adjacent the rear end of said chassis and in which said tag wheel set is elevated out of engagement with the road surface, and a second extended position spaced rearwardly of said chassis in which said tag wheel set engages the road surface and supports a portion of the chassis load, said mounting means including slide members carried by the chassis and horizontally pivotally connected to the forward ends of said beam means and further including slipway means fixed with respect to the chassis behind the slide members and including guide means confining said intermediate beam portions vertically and horizontally at the slipway, the slipway means and the slide means being mutually oriented such that the rear end of the tag frame supporting the tag wheel set is raised when the tag frame is retracted and lowered when the tag frame is extended; and

c. drive means mounted on said chassis and connected to said slide members for driving said tag frame longitudinally with respect to said chassis between said retracted and extended positions.

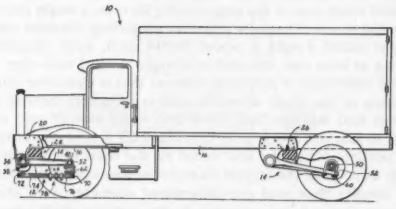
## 3,895,819
## SINGLE AXLE SUSPENSION SYSTEM

**Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706**

**Continuation-in-part of Ser. No. 293,648, Sept. 29, 1972, abandoned, and Ser. No. 196,982, Nov. 9, 1971, Pat. No. 3,767,222. This application May 2, 1973, Ser. No. 356,496**

**Int. Cl. B60g 11/22**

**U.S. Cl. 280—124 R** **11 Claims**



**1.** A vehicle axle suspension system operatively providing a progressively increasing spring rate, comprising in combination, a vehicle frame structure, a support bracket depending from and secured to said vehicle frame structure, a support trunnion assembly secured to said support bracket, a load-bearing vehicle axle disposed below said frame structure, a suspension beam member cooperatively interconnecting said trunnion assembly and said vehicle axle at first and second ends thereof, respectively, a lower spring seat integral with an disposed upon said beam member intermediate said trunnion assembly and said vehicle axle, a cooperating upper spring seat secured to and supporting said vehicle frame, and a compressively resilient load-deflectible spring member disposed in contact with and interconnecting said lower and said cooperating upper spring seats, said spring member being operatively compressed between said spring seats under load, and said vehicle axle being disposed vertically between said second end portion and a torque rod hingedly interconnected to both said support bracket and said vehicle axle.

## 3,895,820
## VEHICLE-HEIGHT CONTROL DEVICE

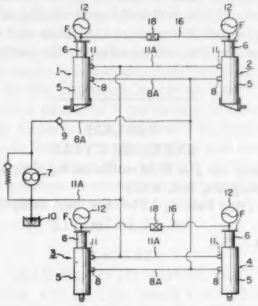
**Noriyuki Takahashi; Hiromitsu Miyahara, both of Tokyo, and Hidehiko Inoue, Oimachi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 8, 1974, Ser. No. 449,470**

**Claims priority, application Japan, Mar. 12, 1973, 48-28784**

**Int. Cl.[2] B60G** *13/08*

**U.S. Cl. 280—124 F** **8 Claims**



1. An automatic vehicle-height control device for use on a vehicle having a body with left and right sides and front and rear wheels at said left and right sides, said device comprising a plurality of hydraulic cylinder assemblies disposed between the body and respective road wheels of the vehicle on the left and right sides thereof, each of said cylinder assemblies including a pair of hollow inner and outer telescopic cylindrical members in fluid communication with each other, each hollow cylinder assembly defining an interior hollow space, said outer member having a fluid inlet port and a fluid outlet port extending therethrough, said inlet port being in communication with a source of fluid under pressure, said outlet port being in communication with ambient atmosphere, said inner telescopic member being vertically slidable and sealingly supported in said outer member, an annular bearing member interposed between said telescopic members, said bearing member having a pair of upper and lower annular grooves facing said inner telescopic member and a land portion of a predetermined vertical length defined between said grooves, said inner telescopic member having a through aperture located in a position to be closed by said land portion of said bearing member when the relative length between said inner and outer members is within a predetermined normal range, said aperture being operable to control the communication between said fluid outlet or inlet port and the interior space of the associated cylinder assembly in accordance with relative telescopic movement between said inner and outer members, and means including a hydraulic resistance connecting the interior spaces of a respective pair of said hydraulic cylinder assemblies positioned on the right and left sides of the vehicle.

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## 3,895,821
## INFLATION APPARATUS FOR SAFETY DEVICE

**Jerome W. Schotthoefer, New Baltimore, and Arduino Colasanti, Detroit, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed June 1, 1973, Ser. No. 365,907**

**Int. Cl. B60r** *21/06*

**U.S. Cl. 280—150 AB** **10 Claims**

1. Inflation apparatus adapted to be disposed in a vehicle for inflating a bag upon receipt of an electrical current from an impact detecting means responsive to impact of the vehicle, comprising:

a. gas-containing means provided with a pressurized gas;

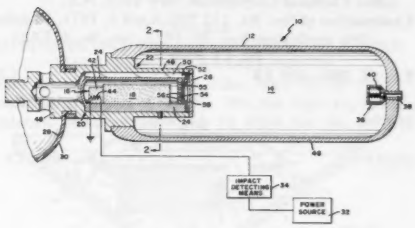
b. gas generating means provided with a gas generating material;

c. actuating means for igniting the gas generating material upon receipt of the electrical current to form a generated gas; and

d. gas releasing means associated with said gas-containing means and having a conduit in communication with the interior of said bag, said gas releasing means comprising:

i. housing means containing said gas generating means;

ii. sealing means consisting of a first portion separating said pressurized gas from said gas generating means



and a second portion separating said pressurized gas from said conduit, said first and second portions having uniform sealing strength; and

iii. rupture means disposed adjacent to said sealing means for applying rupturing force thereagainst, said rupture means being so constructed as to direct said rupturing force against each of said first and second portions of said sealing means upon ignition of said gas generating materials, the rupture means contacting said second portion of said sealing means directly at said conduit, whereby gas released from said gas-containing means and said gas generating means flows into and inflates the bag.

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## 3,895,822
## SAFETY DEVICE

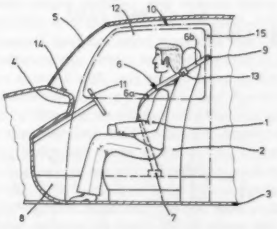
**Ulrich Seiffert, Jahnskamp, and Burckhard Struwe, Fallersleben, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany**

**Filed Sept. 28, 1973, Ser. No. 401,679**

**Claims priority, application Germany, Sept. 28, 1972, 2247595**

**Int. Cl. B60r** *21/2*

**U.S. Cl. 280—150 SB** **6 Claims**



1. A vehicular safety device for restraining movement of a seated passenger in the event of a sudden deceleration of a vehicle having door and window substantially adjacent an occupied seat, said device comprising:

first and second releasably interconnected belt elements, one end of said first element being connected to a vehicular frame member adjacent one side of the seat and one

end of said second element being connected to the door adjacent the periphery of the window rearwardly of the passenger at the other side of the seat, said releasable interconnection being substantially closer to said one end of said second belt element than to said end of said first belt element and being situated not lower than a horizontal plane including the lower boundary of the window when the vehicle door is closed.

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**3,895,823**

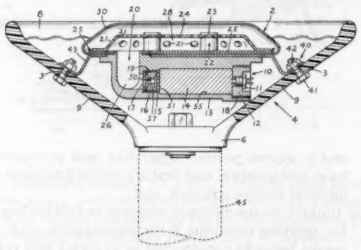
## VEHICLE PASSENGER SAFETY ASSEMBLY

**Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, New York, N.Y.**

**Continuation of Ser. No. 132,700, April 9, 1971, abandoned. This application Nov. 20, 1973, Ser. No. 417,657**

**Int. Cl. B60r** *21/08*

**U.S. Cl. 280—150 AB** **7 Claims**



1. A safety assembly, disposed in a vehicle, comprising:

a pyrotechnic gas generator means as sole source of inflating gas, said gas generator means being located centrally of the steering wheel of said vehicle and spaced upwardly from the hub thereof;

a manifold means connected to and in communication with said gas generator means;

an inflatable gas bag connected about and in communication with said manifold means; and

connecting means to connect said generator means, said manifold means and said inflatable gas bag together and solely to the spokes of the steering wheel of said vehicle.

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**3,895,824**

## PASSIVE ACTUATING DEVICE FOR A SAFETY BELT

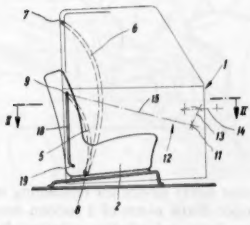
**Andrfas Bauer, and Erwin Blüggel, both of Fallersleben, Germany, assignors to Volkswagenwerk Aktiengesellschaft, DT**

**Filed Feb. 13, 1974, Ser. No. 442,076**

**Claims priority, application Germany, Feb. 23, 1973, 2308980**

**Int. Cl. B60r** *21/02*

**U.S. Cl. 280—150 SB** **8 Claims**



1. A passive actuating device for a safety belt associated with a seat in a vehicle comprising (*a*) lever means pivotally mounted in a door of the vehicle and including two interconnected arms oriented at an angle to each other, (*b*) means defining in an interior wall of the door a slot that has a lower end and an upper end located higher on the door than the lower end, (*c*) means passing through the slot for coupling one arm of the lever means to a portion of the safety belt and (*d*) stop means for limiting outward opening movement of the door and for yieldingly resisting inward closing movement of the door from at least one open position, the stop means coupling the other arm of the lever means to the vehicle body, the one arm of the lever means being coupled to the safety belt and the other arm being coupled to the stop means so that, upon opening of the door, the one arm is pivoted into a first position and the portion of the safety belt is raised relative to the associated vehicle seat and, upon closing of the door, the one arm is pivoted into a second position and the portion of the safety belt is lowered relative to the associated vehicle seat.

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**3,895,825**

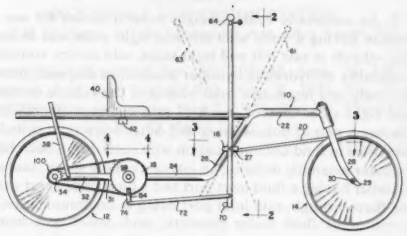
## EXERCISE CYCLE

**Robert L. Sink, c/o J & R Manufacturing Co., 10 N. Edmondson, Indianapolis, Ind. 46219**

**Filed Feb. 6, 1974, Ser. No. 440,071**

**Int. Cl. B62m** *1/12*

**U.S. Cl. 280—234** **19 Claims**



1. An exercise cycle comprising a frame having a seat mounted thereon, and front and rear wheels rotatably mounted at opposed ends thereof, said front wheel being pivotally mounted to said frame to permit steering of the cycle; a driving column pivotally mounted intermediate its length to said frame for oscillatory movement parallel to the plane of said frame; a one-way clutch rotatably mounted on said frame, said clutch having a clutch housing and a clutch plate, said plate having means thereon for operably engaging said housing upon rotation of said plate in a first direction to continuously drive said housing in the same direction, said means on said plate being partially engageable with saidi housing when said plate is stationary and when said plate is rotated in a relative direction opposite said first direction with respect to said housing to cause said housing to impose a dragging force on said plate; a driving link pivotally coupled between said column and said clutch to cause said clutch to rotate in response to oscillatory movement of said column; means coupling said clutch to said rear wheel to transmit rotational motion of said clutch to said rear wheel; a steering rod rotatably mounted to said driving column for rotation about its own axis and for oscillation with said column; a handle bar rotatably mounted to the upper end of said column and coupled to said steering rod for oscillating said column and for rotating said rod in response to oscillatory and rotary forces applied thereto; a universal joint at the lower end of said rod and having its pivot point disposed along the same general axis as the pivot point of said column; and means coupling said universal joint to said front wheel to turn said front wheel in response to rotation of said steering rod.

## 3,895,826
## PROCESS OF MAKING DISPERSION OF UREA-FORMALDEHYDE RESINS

**Raymond Harry Gunning, Box Hill North, and Frederick John Lubbock, Beaumaris, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia**

**Filed Sept. 24, 1974, Ser. No. 508,994**

**Claims priority, application Australia, Oct. 4, 1973, 5102/73**

**Int. Cl. C08g** *9/10, 51/28, 53/18*

**U.S. Cl. 260—33.6 R** **2 Claims**

1. A process of preparing beads of urea-formaldehyde resin in which an aqueous urea-formaldehyde convertible syrup which has a solids content of at least 65% by weight and a mol ratio of formaldehyde to urea of 1.9 – 2.3 to 1 is dispersed in the form of globules in a hydrocarbon liquid in the presence of a stabiliser for the dispersion and from 0 to 15% by weight of the continuous phase of a polymeric thickener therefor, converting the disperse syrup globules to hard polymer by adding a catalyst for the curing reaction and then azeotropically stripping water from the system to give an anhydrous slurry of solid polymer beads with diameters within the range of 1–100 microns in hydrocarbon liquid.

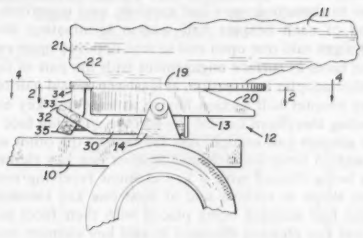
## 3,895,827
## TRACTOR-TRAILER FIFTH WHEEL SAFETY LOCK

**James D. Padrick, 420 N. 12th, Beach Grove, Ind. 46107**

**Filed May 30, 1974, Ser. No. 474,799**

**Int. Cl. B62d** *53/10*

**U.S. Cl. 280—432** **2 Claims**




1. A tractor-trailer fifth wheel safety lock comprising:

a truck having a rearwardly extending platform;

a fifth wheel pivotally mounted atop said platform and including a rearwardly opening slot;

a trailer having a main frame with a front edge portion;

a plate fixedly mounted beneath and to said main frame at said front edge portion and including a projection extending down from said main frame into said slot, and a forward edge portion with an arcuate recess with length opening through said forward edge portion and stop surfaces positioned at opposite ends of said recesses, said recess opening through said forward edge portion entirely along said length from one of said stop surfaces to another of said stop surfaces, said recess forms an arc of a maximum angle about said projection;

a stop block movably mounted to said platform;

means connected to said block and operable to move said block into and out of said arcuate recess, said block contactable against said stop surfaces when in said recess to limit relative pivotal movement between said plate and said fifth wheel;

a pair of spaced apart arms fixedly mounted to and beneath said fifth wheel, said arms having proximal ends with said block pivotally mounted therebetween;

said block has a top end and a bottom end with said proximal ends of said arms fastened to said block between said top end and said bottom end;

said means is operable to pivot said top end forward of said block to disengage said block from said plate;

said means includes a cylinder motor mounted to said fifth wheel, a source of pressurized fluid, an electrically operated fluid valve disposed between said motor and said source of pressurized fluid, a source of electrical energy and an electrical switch connecting said source of electrical energy to said electrically operated fluid valve;

said cylinder motor has an extendable piston rod fastened to said bottom end of said block;

said truck includes front wheels turnable through a maximum steering angle not less than the angle of said arc.

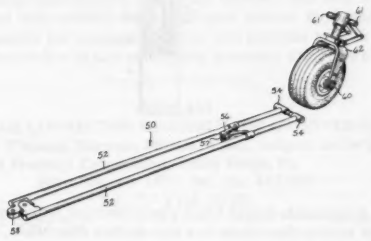
## 3,895,828
## GRIPPING DEVICE FOR ACCOMMODATING EITHER MALE OR FEMALE COMPONENTS

**Edward Bitantis, 1639 Howard, Niles, Mich. 49120**

**Continuation-in-part of Ser. No. 396,766, Sept. 13, 1973, abandoned. This application July 22, 1974, Ser. No. 490,678**

**Int. Cl.²** **B60D** *1/14*

**U.S. Cl. 280—493** **3 Claims**

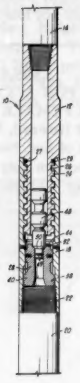



1. A gripping device for towing aircraft, said aircraft having a tow connection including either oppositely extending protrusions or oppositely located outwardly opened socket parts, said gripping device comprising an elongated bar means adapted at one end for connection to a tow means and having its other end defining a pair of opposed grip means shiftable toward and away from another, each grip means having an outer housing, said housing including (a) a side wall defining a chamber within said housing with said chamber having an open end and (b) a center member having a longitudinal axis and an outer surface, and (c) a plurality of sleeves telescopically fitted about said center member and being coaxial therewith with said center member and sleeves fitting within said housing chamber and protruding from said chamber at the open end thereof into extended positions and (d) means securing said sleeves and center member to said housing within the chamber thereof with said securement means permitting relative shiftable movement between said sleeves and center member and (e) biasing means individually urging said sleeves and center member into said extended positions with each sleeve having inner and outer surfaces, the outer surfaces of each sleeve and center member forming a socket part engaging surface, the inner surface of each sleeve forming a protrusion engaging surface, said sleeves and said center member being shiftable relative to each other along the axis of the center member between retracted positions wherein said sleeves and center members are shifted further into said housing chambers and said extended positions to engage various sized socket parts and protrusions, said pair of grip means for engaging either said socket parts or protrusions of the aircraft tow connection when shifted toward one another enable said tow means when connected to said bar means to tow said aircraft.

## 3,895,829
## RELEASABLE PIPE CONNECTOR

Charles D. Manson, Jr., Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 4, 1974, Ser. No. 439,143
Int. Cl.[2] F16L *37/24*
U.S. Cl. 285—3 8 Claims



1. A releasable breech block pipe connector, for connecting a pipe section thereabove to a pipe section therebelow, which comprises:

a. an upper tubular breech block member including:

i. means for connecting an upper end of said upper tubular breech block member to the pipe section thereabove; and

ii. interrupted threads positioned at the lower end thereof, said threads being interrupted along longitudinally extending spaces;

b. a lower tubular breech block member including:

i. means for connecting a lower end of said lower tubular breech block member to the pipe section therebelow; and

ii. interrupted threads positioned at the upper portion thereof, said threads being interrupted along longitudinally extending spaces and being arranged to engage in breech block manner with said interrupted threads of said upper tubular breech block member whereby said upper and lower tubular members can be selectively connected or disconnected by rotational and longitudinal movement relative to each other;

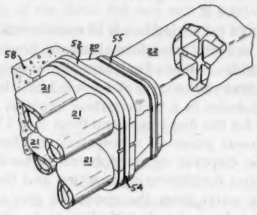
c. locking sleeve means for locking said upper and lower breech block tubular members against relative rotation, when said tubular members are breech block engaged and said locking sleeve means is fully positioned at an uppermost location within one of said tubular members, for allowing relative rotation of said tubular members when said locking sleeve means is moved to a lower location and for moving from said uppermost location to said lower location responsive to downward force applied to said locking means; and

d. means for maintaining said locking sleeve means at said uppermost location until at least a predetermined downward force is applied to said locking means, said maintaining means adapted to allow movement of said locking sleeve means from said uppermost position to said lower location after only application of at least said predetermined downward force.

## 3,895,830
## CONDUIT ADAPTER

John R. Madlem, Box 136A3, High Falls Rd., R.D. 1, Catskill, N.Y. 12414

Filed Apr. 1, 1974, Ser. No. 457,066
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—27 17 Claims



1. An adapter for joining a conduit of substantially square internal open cross section to a conduit of substantially circular internal open cross section comprising in combination, a pair of adapter outer half sections each of which has one open end of semi-circular shape and the opposite open end of semi-square shape, said one open end and said opposite open end being spaced apart with an intervening wall extending therebetween, the inside surface of said intervening wall changing gradually in cross sectional shape from semi-circular to semi-square to thereby form a half conduit, said intervening wall section of each adapter half section terminating along its length from said one open end to said opposite open end in a pair of faces in surface engagement with the pair of faces of the other adapter half section, at least one of said pair of faces of one adapter half section having at least one key element extending therefrom toward the surface engaging face of the other adapter half section, and the face of the other adapter half section toward which said at least one key element extends being formed with a key element receiving recess of proper shape to receive said at least one key element, said adapter half sections being placed with their faces engaged and said key element disposed in said key element receiving recess to thereby form a conduit of circular cross sectional opening at one end which transitions through the length of the adapter to substantially a square cross sectional opening at the other end and in which the assembled adapter halves are restrained from relative sliding movement by said interengaged key element and key element receiving recess, and means holding the adapter sections in assembled relationship.

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## 3,895,831
## SEAL ASSEMBLY PROVIDING DUAL SEAL ZONES

Edward Fisher, Buffalo, N.Y., assignor to Conax Corporation, Buffalo, N.Y.

Filed May 10, 1973, Ser. No. 358,878
Int. Cl. F16l *35/00*
U.S. Cl. 285—93 10 Claims

1. A seal assembly comprising an object having a cylindrical periphery which penetrates an opening through a body member,

means providing an abutment portion of the wall of said opening as an annular seat;

means providing a cylindrical portion of said wall spaced axially from such abutment wall portion;

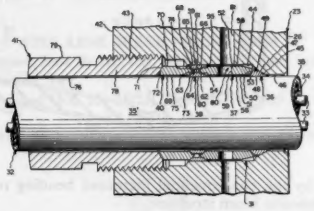
a first metal ferrule surrounding said object and engaged with said seat and one part of said periphery;

a second metal ferrule surrounding said object and engaged with another part of said periphery;

a third metal ferrule surrounding said second ferrule and engaged with such cylindrical wall portion;

an annular intermediate follower engaged at one end with said first ferrule and engaged at its other end with said second and third ferrules; and

thrust means engaged with said second and third ferrules applying thereto a force axially directed toward said seat effective to utilize said first ferrule to provide a first



sealed engagement between said body member and said object, to utilize said second ferrule to provide a second sealed engagement between said intermediate follower and said object and to utilize said third ferrule to provide a third sealed engagement between said intermediate follower and said body member.

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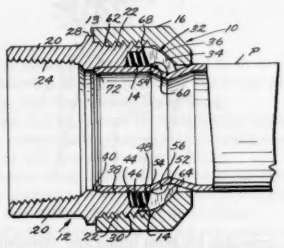
**3,895,832**

## COLLET COMPRESSION CONNECTION

**Daniel A. Ellis, and Lawrence F. Luckenbill, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.**

**Filed May 13, 1974, Ser. No. 469,495**
**Int. Cl.[2] F16L** *21/06*
**U.S. Cl. 285—322** **12 Claims**



1. An improvement in a collet-type of joint for connecting an end portion of a smooth wall pipe to fittings or other pipes comprising:

a ring-type compression nut having an opening therethrough of a diameter sufficient to insert the smooth wall pipe and having an interior camming surface, said compression nut also having threads thereon;

a hollow body having a passageway therethrough, an axially extending end portion on said body member and through which a portion of said passageway extends, said end portion of said body member terminating in a nose having an exterior camming surface for cooperating with the camming surface on said nut and said nose having a plurality of longitudinal slots therein which provide constrictable arcuate fingers on the end portion of said body member, said portion of said passageway in said end portion of said body member having an annular shoulder at its inner end facing outwardly and having an interior diameter less than the outside diameter of the pipe and arranged for initial abutting of the end of the pipe and further having an annular groove therein adjacent to said nose and spaced outwardly of said shoulder, said annular groove being defined by an outwardly facing wall, a bottom wall, and a rearwardly facing wall in said nose and into which said slots extend, a first interiorly extending tooth on said nose defined by arcuate tooth segments adjacent the end of the fingers thereof, a second interiorly extending tooth on said nose defined by arcuate tooth segments of the fingers thereof, said second interiorly extending tooth being spaced inwardly from said first interiorly extending tooth to define between said first and second teeth an annular space, and said second tooth having one face defining the rearwardly facing wall of said annular groove, said first tooth having a crest diameter sufficient to receive said pipe prior to constriction of the fingers of said nose and said second tooth having a crest diameter prior to constriction of the fingers of said nose greater than the crest diameter of said first tooth, and threads on the end portion of said body member for cooperating with the threads on said compression nut;

and a sealing ring in said annular groove in the end portion of said body member, said sealing ring being deformed into sealing engagement with said pipe by the one face of said second tooth when the arcuate fingers of said nose are constricted by said compression nut, said first tooth initially engaging and gripping said pipe and any material of said sealing ring flowing outwardly along said pipe being received into said space between said first tooth and said smooth tooth until said second tooth subsequently just engages said pipe and provides a block for further flow of said sealing ring outwardly along said pipe.

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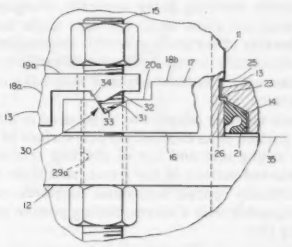
**3,895,833**

## FLANGE CONNECTOR ASSEMBLY FOR GROOVED PIPE

**Leo K. Thiessen, Shawnee Mission, Kans., assignor to Certain-Teed Products Corporation, Valley Forge, Pa.**

**Filed Feb. 19, 1974, Ser. No. 443,663**
**Int. Cl.[2] F16L** *23/00*
**U.S. Cl. 285—413** **5 Claims**



1. A flange connector assembly for coupling a grooved pipe to a matching flanged member comprising:

a plurality of arcuate flange segments for positioning on the pipe and assembling to make a complete, rigid, circular connector;

said complete connector having a front face adapted to abut flush against the matching flanged member, a rear face, a radially inboard lip to engage the pipe groove, a central, circumferential recess therein opening out of the front face and adjacent the pipe to receive a gasket, and bolt apertures through the body thereof;

each of said segments having opposite and unlike end ear portions of lesser thickness than the rest of the segment extending from the ends thereof, the opposite ear portions of a given segment oriented in line with the front and rear faces of the segment, respectively, whereby to be displaced from one another;

each said segment ear portion operative to overlap an unlike ear portion of another segment in assembly of the connector;

each segement ear portion having an oversized bolt hole therethrough; and

unlike wedge means mounted on each of said segment ear portions and facing in opposite directions on said segment adapted to cooperate with the unlike wedge means and oversized bolt apertures of adjacent segments in assembly of the circular connector,

whereby tightening of bolts engaging overlapping ear portions of adjacent segments causes the wedge means thereof to force the segments into rigid engagement, one with the other, against the matching flange member.

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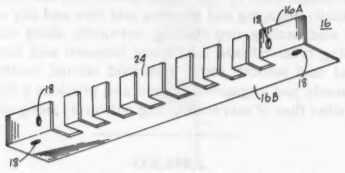
**3,895,834**

## JIMMY PROOF GUARD FOR DOOR

**Aron Grinbaum, and Solomon Jakubowicz, both of 8 Sultana Ave., Toronto, Ontario, Canada**

**Filed Mar. 25, 1974, Ser. No. 454,774**
**Int. Cl.[2] E05C *19/00***
**U.S. Cl. 292—346** **3 Claims**




1. A jimmy proof guard for a door in a door frame, said guard comprising:

a female member adapted to be secured in a flush manner to a portion of an exposed vertical edge of the frame and to the associated exposed vertical flat surfaces extending at right angles to each other to define the edge, said female member being vertically elongated, defining in horizontal cross section a right angle and containing a plurality of vertically spaced L shaped slots which extend horizontally across both of said surfaces and communicate with a vertical exposed side edge on one selected surface; and

a male member adapted to be secured in a flush manner to a portion of an exposed vertical surface of the door which is swung into and out of abutting relationship with the selected surface of the frame, said male member having vertically spaced horizontal members each detachably engagable with a corresponding portion of a corresponding slot.

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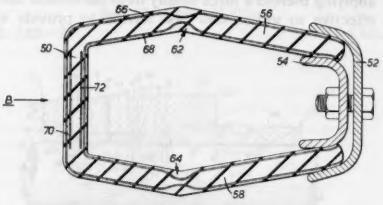
**3,895,835**

## ENERGY ABSORBING DEVICES

**Ian M. Thomson, Wokingham, England, assignor to Enersorb Limited, Camberley, England**

**Filed July 23, 1973, Ser. No. 381,553**
**Claims priority, application United Kingdom, Aug. 11, 1972, 37678/72; Nov. 2, 1972, 50651/72**
**Int. Cl. B60r *19/08***
**U.S. Cl. 293—71 R** **42 Claims**

1. An energy controlling device comprising elastomeric material with a plurality of filaments of flexible material embedded therein and bonded or mechanically locked thereto so as to produce a composite beam structure, the composite beam structure being so arranged for mounting with respect to the positioning of the filaments in the elastomeric material and with respect to a predetermined impact direction that when the structure bends in response to an impact occurring in said direction at least some of the filaments are placed in compression and at least some of the filaments are placed in tension, the filaments having such cross-sectional area and modulus of elasticity that the compressive forces generated in the structure by the impact are principally taken by the filaments and the energy of the impact is at least partially controlled by the consequential increased bending reistance of the composite beam structure.

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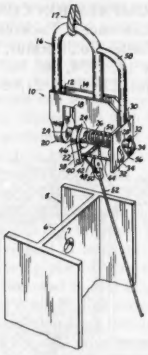
**3,895,836**

## STRUCTURAL MEMBER LIFTING AND RELEASING DEVICE

**Eldridge Barnes, Rt. 4, Box 142, Okemah, Okla. 74859**

**Filed Oct. 25, 1973, Ser. No. 409,549**
**Int. Cl. B66c *1/36***
**U.S. Cl. 294—83 R** **1 Claim**



1. An apparatus for hoist lifting and releasing an elongated structural member comprising:

a generally planar body disposed in a vertical plane and having a transverse downwardly open slot in the general form of an inverted U for receiving an edge portion of the structural member to be lifted,

said body having an aperture transversely intersecting the legs of the U-shape;

an elongated reciprocable locking member having one end portion arranged to be projected horizontally across the legs of the U-shape through the aperture;

at least one pulley mounted on said body beside the other end portion of said locking member;

an end plate transversely secured to one end of said body, said plate having an opening coaxial with the body aperture, said other end portion of said locking member being coaxially received slidably by the opening;

a resilient member normally biasing said one end of said locking member across the legs of the U-shape;

a control line entrained around said pulley and operatively connected with said locking member for withdrawing said locking member from its position across the legs of the U-shape in response to a downward pull on the line;

a bail connected with said body opposite the opening of the U-shape slot for connection with a hoisting cable;

a pair of bars secured to said body intermediate its ends in depending spaced relation; and,

a roller extending between said bars and being journalled thereby for rotation about a horizontal axis normal to the plane of said body,

the depending portion of said line adjacent said pulley being entrained over said roller.

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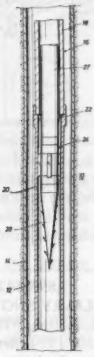
**3,895,837**

## WIRE LINE SPEAR MECHANISM

**Willard Barnes, New Iberia, La., assignor to Wilson Industries, Inc., Houston, Tex.**

**Filed Oct. 25, 1973, Ser. No. 409,429**
**Int. Cl. E21b** *31/10*
**U.S. Cl. 294—86.1** **8 Claims**



1. A wire line spear mechanism adapted to be lowered into a well for retrieving broken wire line from the production tubing of wells, said mechanism comprising:

a body portion having means for establishing connection of said body portion to a string of manipulating conduit that is extended into the production tubing;

a wire line spear being connected to the lower extremity of said body portion and including means for engaging broken wire line within the production tubing;

a plurality of tubing wiper means being retained in said body portion and being radially movable relative to said body portion and biased outwardly from said body portion to centralize said wire line spear inside said production tubing and to prevent said wire line spear from extending beyond convolutions of broken wire line more than a fixed distance between said wiper means and said wire line spear.

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**3,895,838**

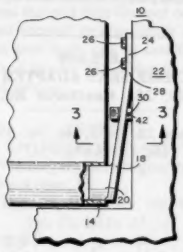
## TAILGATE MOUNT

**Ben Hamada, 900 N. Broadway, Suite 725, Santa Ana, Calif. 92701**

**Filed Sept. 4, 1973, Ser. No. 394,400**
**Int. Cl. B60j** *5/10*
**U.S. Cl. 296—57 R** **2 Claims**

1. A semi-rigid mount for a hinged truck tailgate, comprising:

a single integral generally planar base having a bend near a first end which end is fixedly coupled to the side of the truck, the base having a second end having coupled thereto a hinge pin, wherein the surface of the base defines a hole through the center thereof generally parallel to the axis of the hinge pin coupled thereto; bistable rotatable cam means removeably coupled to the base, the cam means capable of retaining the base in two positions, a first position bent and a second position less bent than the first position, the rotatable cam means rotatably coupled to the truck and passing through the hole, wherein



the rotatable cam means include a cam capable of passing through the hole when oriented in a first selected direction and incapable of passing through the hole and thereby holding the base in the first position when rotated in a second selected direction.

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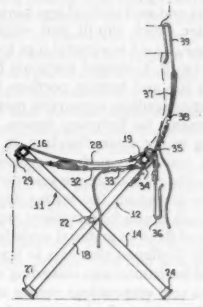
**3,895,839**

## PORTABLE FOLDING SEAT

**Harry Amato, 99 Larkin St., Revere, Mass. 02151**

**Filed Dec. 13, 1973, Ser. No. 424,455**
**Int. Cl. A47c** *3/32*
**U.S. Cl. 297—4** **5 Claims**



1. A portable folding seat of the type which is adapted to be secured to apparel of a user when not in use, said seat comprising:

first and second inverted U-shaped frames of light weight material, each including first and second legs joined by a cross-piece, said frames being pivotally joined to one another along a common axis through said legs, the legs and cross-piece of said first frame being slightly larger than the legs and cross-piece of said second frame such that in a closed pivotal position of said frames said second frame fits entirely within the periphery and thickness of said first frame;

a strip of foldable material extending between the cross-pieces of said first and second frames to define a seating portion when said frames are in an open position;

adjustable means for adjusting the length of said strip of material extending between said cross-pieces to vary the height of and spacing between said cross-pieces in the open position of said frames, thereby permitting the height of said seating portion to be adjusted at will; and attachment means for removably supporting said seat behind and from the waist of said user, said attachment means comprising; first means for supporting said seat at

a standard position below said user's waist when said seat is being carried in a non-deployed condition; and second means for supporting said seat at an adjustable position below the user's waist with the frames in an open position to facilitate deployment of said seat by users of different heights.

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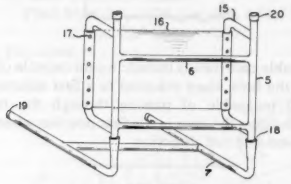
**3,895,840**

## CHAIR SEAT ADAPTER

**Dolores Szurszewski, 355 Hawthorne Rd., Pittsburgh, Pa. 15209**

**Filed June 28, 1973, Ser. No. 374,540**
**Int. Cl.[2] A47C** *7/42*
**U.S. Cl. 297—230** **1 Claim**




1. A back support for short persons for decreasing the seating depth of a chair or safa seating cushion, comprising a pair of L-shaped members, cross-members for rigidly supporting horizontal and vertical legs of said L-shaped members in spaced, parallel relationship, said L-shaped members being of tubular construction and said vertical legs having bottom ends of reduced diameter which slip-fit into vertically upwardly extending extensions of said horizontal legs to form a readily detachable fit therewith, U-shaped elements having extremities secured to the top and bottom portions of said vertical legs, a back-contacting resilient supporting means mounted on said U-shaped elements by fastening means, said U-shaped elements extending in the same direction as said horizontal legs, and said back contacting surface extending in a vertical plane in spaced parallel relationship to said vertical legs by the distance desired for decreasing the seating depth of said seating cushion, said back contacting resilient supporting means comprising a sheet of flexible material stretched between the base portion of said U-shaped elements to serve as said back resting surface, said horizontal legs extending underneath said seating cushion and said vertical legs resting against the back of said chair or sofa cushion, the bottom end of said resilient supporting means being spaced by about the thickness of said seating cushion from said horizontal legs, without obstruction therebetween so as to allow said seating cushion to fit therebetween and extend laterally outwardly of the vertical planes of said L-shaped elements, and so that when a short person is seated, his weight rests on the seating cushion and horizontal legs of said back support to hold the back support firmly in place.

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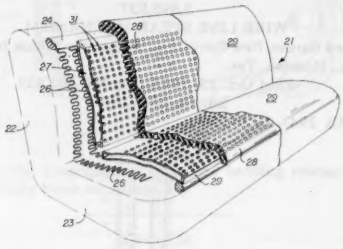
**3,895,841**

## VACUUM ACTUATED VEHICLE SAFETY DEVICE

**Herbert A. Lebert, 25 Windsor Dr., Hillsborough, Calif. 94010**

**Filed Sept. 3, 1974, Ser. No. 502,651**
**Int. Cl.[2] A62B** *35/00*
**U.S. Cl. 297—384** **12 Claims**

1. A device to momentarily hold an occupant in a vehicle seat against impact-created forces tending to impel the occupant out of his seat, comprising a seat cushion having an air-pervious outer covering, first means in said cushion having a cavity, a plurality of passages throughout said cushion, each leading from said cavity to a discrete area of said covering, a first valve in each said passage, each said first valve having valve opening means shaped to be individually contacted by the body of said occupant and responsive to the pressure of the occupant against said valve opening means, said valve opening means opening communication through the particular first valve with which it is associated through one said passage to said cavity only when a portion of the body of the occupant rests on said valve opening means, said cavity having a normal pressure state and an emergency vacuum state, said first means when in vacuum state pulling air through only those first valves which are open to create a subatmospheric




pressure between the occupant and said cushion tending to force the occupant toward said cushion, a source of vacuum, a conduit between said source and said cavity, and a normally-closed impact second valve in said conduit, said second valve having second means therein responsive to impact against the vehicle in which the seat is installed to open said valve, whereby said cavity is changed from pressure state to vacuum state.

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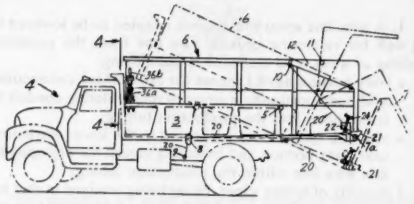
**3,895,842**

## AUXILIARY SNOW BODY

**Walter R. Fair, Menno, S. Dak. 57045**

**Filed July 30, 1974, Ser. No. 493,096**
**Int. Cl. B60p** *1/00*
**U.S. Cl. 298—1 R** **9 Claims**




1. In a dump truck having a load carrying dump body having a bottom and sides and including a mechanism for dumping the same,

an enlarged insert body unit adapted to be mounted within the dump body to increase the load carrying capacity thereof for use in moving relatively large volumes of snow and other light weight materials,

said insert unit comprising,

a smooth-surfaced bottom panel substantially longer than the dump truck body and slightly narrower than the inside width of said truck body to be received therewithin and extend rearwardly therebeyond,

a pair of upstanding sides connected at their lower edges to said insert bottom and extending a substantial distance above the sides of the dump truck body,

means for rigidly connecting the front ends of said insert sides,

a tail gate connecting at rear ends of said sides and normally retaining the load within said body insert but being hinged to permit the load to be dumped when the truck dumping mechanism is actuated, and

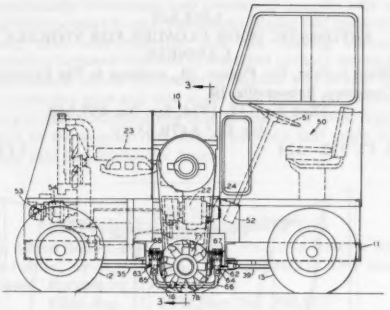
means for removably attaching the insert unit to the dump body of the truck to positively anchor the same therein

when in use but permitting the insert unit to be removed from the dump body when heavier loads are to be carried by the truck.

## 3,895,843
## ROAD PLANING MACHINE

**Christopher Wall; Ronald Scaife, and Tnomas A. Wood, all of Wakefield, England, assignors to British Jeffrey-Diamond Limited, Dallas, Tex.**

**Filed Oct. 23, 1973, Ser. No. 408,596**
**Int. Cl. E21c** *47/00*
**U.S. Cl. 299—39** **20 Claims**



1. A planing machine for planing roads or other paved surfaces, comprising:

a frame;

first and second ground engaging supporting means mounted at fore and aft locations along one side of said frame;

third ground engaging supporting means mounted on the opposite side of said frame, said first, second and third ground engaging means co-operatively supporting said frame on said surface and capable of moving said frame along a smooth tightly curved path on said surface;

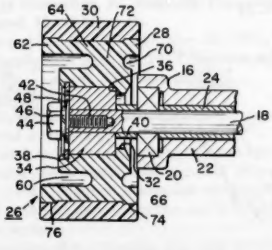
rotary planing means mounted on said frame intermediate and in alignment with said fore and aft ground engaging means and in transverse alignment opposite said third ground engaging means, said planing means being adapted to engage the paved surface for cutting material from the paved surface to a controlled depth; and

power means to propel said machine along said surface and to drive said rotary planing means.

## 3,895,844
## ROLLER SKATE WHEELS

**Rudolph Merbler, 108 Brentwood Ln., Fairport, N.Y. 14450**

**Filed May 22, 1974, Ser. No. 472,008**
**Int. Cl.² B60B** *5/00*
**U.S. Cl. 301—5.7** **8 Claims**



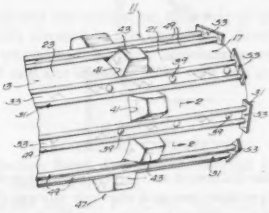
1. A wheel adapted for use in a roller skate having an axle, said wheel comprising

a cylindrical body having an axial opening for receiving said axle, and said body having a cylindrical groove extending axially inwardly from an end face of said body a distance sufficient to define a flexural web along the outer periphery of said body, a second circular groove extending into said body from the end face thereof opposite to said one end face, said second groove being at the same radial distance from said body axis as said first named groove, and said second groove also being of axial depth smaller than said first groove.

## 3,895,845
## TRACK WITH ANTI-SIDE SLIP AND TRACTION BAR

**Gordon B. Hale, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Dec. 28, 1970, Ser. No. 101,782**
**Int. Cl. B62d** *55/24*
**U.S. Cl. 305—35 EB** **11 Claims**

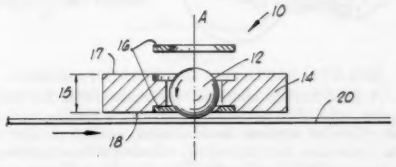


1. A track for a vehicle, said track comprising an elongated belt having an outer surface, and a plurality of bars secured to said outer surface in transverse relation to the length of the belt and in spaced apart parallel relation to one another, each bar comprising a rigid member including a base portion attached to said belt outer surface, a first rib extending from one of the opposed base portion edges extending transversely of said belt and projecting outwardly from said belt outer surface beyond said base portion, a second rib extending from the other of the opposed base portion edges extending transversely of said belt and projecting outwardly from said belt outer surface beyond said base portion, and a flange extending from one end of said base portion in generally upright relation to said base portion and projecting in the direction of the length of said belt, beyond said first and second ribs.

## 3,895,846
## MAGNETIC BALL RETAINING APPARATUS

**William J. Edwards, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Oklahoma City, Okla.**

**Filed Sept. 5, 1974, Ser. No. 503,421**
**Int. Cl.² F16C** *35/00*
**U.S. Cl. 308—10** **2 Claims**



1. A magnetic ball retaining apparatus used as a pressure roller in a media transport, the apparatus comprising:

a metal ball roller; and

a ring magnet having an inner and outer circumferance, said ball roller being captured magnetically within the inner circumferance of said ring magnet, said ball roller having a diameter greater than the width of said magnet and

extending outwardly therefrom and engaging the media as the media is transported thereby.

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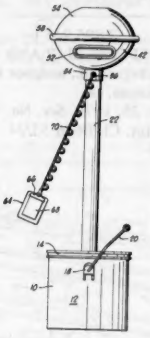
**3,895,847**

## PORTABLE DOCUMENT AND FORM PRESENTATION DEVICE

**William A. Harris, 6007 N.W. 32nd St., Bethany, Okla. 73008**

**Filed Jan. 2, 1974, Ser. No. 430,026**
**Int. Cl. A47b** *81/00*
**U.S. Cl. 312—100** **9 Claims**



1. A portable document and form presentation device facilitating the intermittent use and alternate storage of forms and documents in an outdoor location comprising:
a base;
a standard projecting vertically from said base;
a hollow housing mounted on the upper end of said standard and having a slot in a side wall thereof, said housing comprising two hollow, hemispherical portions joined together along a substantially equatorial, horizontally extending plane;
a flat document and form carrying plate; and
an elongated flexible member connecting said plate to either said standard or housing.

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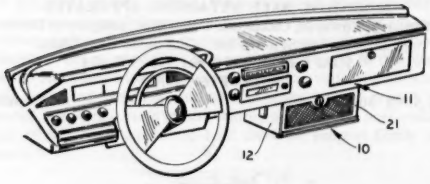
**3,895,848**

## TAPE STORAGE CONTAINER FOR AUTOMOBILES

**Richard D. Walden, 225 Pecan Dr., Martinez, Ga. 30907**

**Filed Nov. 14, 1973, Ser. No. 415,743**
**Int. Cl.[2] A47B** *7/08*
**U.S. Cl. 312—236** **1 Claim**



1. A tape storage container for automobiles for storing magnetic tapes, said container comprising a housing including spaced parallel top and bottom walls, spaced parallel side walls, a pervious door selectively covering a front opening of said housing, a hinge on said door connecting said door to said bottom wall, lock means for locking said door in closed relationship with said front opening, a series of partition means spaced across said housing parallel to said side walls defining spaces therebetween for receipt of a tape, cushion protrusion elements carried by said partition means and extending into said spaces for engaging a tape received within said space, fan means rearwardly of said housing and in communication with said housing a rear wall on said housing rearwardly of said partition means, said fan means communicating with said housing through said rear wall, a plurality of air directing means between said rear wall and said partition means, said air directing means being arranged to direct air from said fan means into said spaces, conduit means communicating with said fan means and with outside ambient air, and temperature responsive means within said housing for energizing said fan means, the arrangement being such that energizing said fan means causes outside air to be directed into said spaces and to pass between said partition means and a tape received within said spaces to be discharged through said pervious door.

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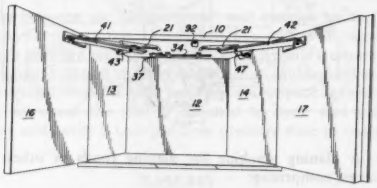
**3,895,849**

## AUTOMATIC DOOR CLOSURE FOR STORAGE CABINETS

**William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Company, Bensenville, Ill.**

**Filed Aug. 14, 1974, Ser. No. 497,140**
**Int. Cl.[2] A47B** *88/00*
**U.S. Cl. 312—324** **7 Claims**



1. A door closing mechanism for a storage cabinet, having a top and back walls and side walls, a pair of doors hingedly connected along opposite edges of said side walls, said closing mechanism for each of said doors comprising a hydraulic check including a piston housing and a piston means reciprocable therein, a check spring, pivot means connecting said piston means and one end of said check spring at a common location on said door, means connecting the other end of said check spring to the side wall of said cabinet, and pivot means connecting said housing to said cabinet top wall, so that the moment of force extending between the door hinge and said pivot means is at substantially right angles to the force applied by said spring in the closed position of said doors, and so that said spring and said hydraulic check are substantially in quadrature position in said closed door position.

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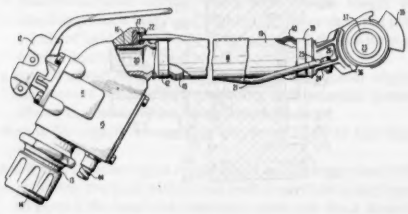
**3,895,850**

## ELECTROPNEUMATIC TRAINLINE CONNECTOR

**Thomas H. Engle, Cape Vincent; Glen O. Bohusch, Watertown, and Thomas M. Bogenschutz, Clayton, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.**

**Filed Nov. 9, 1973, Ser. No. 414,461**
**Int. Cl. H01r** *3/04*
**U.S. Cl. 339—15** **10 Claims**



1. An electropneumatic connector for a train signal line and pneumatic brake pipe, said connector comprising:

a brake pipe angle cock adapted to be mounted on a rail vehicle at the end of said brake pipe;

a non conductive brake pipe hose having first and second ends;

an electrically conductive pneumatic coupler attached to the first end of said nonconductive hose, for providing electrical and pneumatic coupling between said hose and a similar hose from another train car;

first contact means mounted on and insulated from said angle cock for receiving signals from said train line;

second contact means mounted on the second end of said nonconductive hose;

conductor means traversing the length of said hose for electrically connecting said pneumatic coupler with said second contact means; and means joining said angle cock and said nonconductive hose for making electrical contact between said first and second contact means and pneumatic contact between the second end of said nonconductive hose and said angle cock during the connecting of said nonconductive hose to said angle cock, regardless of the angular orientation between said angle cock and said nonconductive hose.

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**3,895,851**

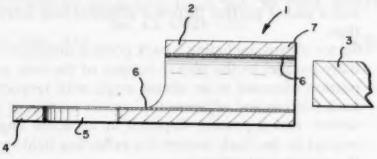
**BRITTLE-SURFACED CONNECTOR**

**James Alfred Bolton, Winston-Salem, N.C., and Howard Richard Peiffer, New Cumberland, Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Aug. 23, 1973, Ser. No. 390,975**

**Int. Cl.[2] H01R** *11/20*

**U.S. Cl. 339—95 R** **6 Claims**




1. An electrical connector having a crimp-termination means for receiving an electrical wire and forming a connection therewith upon crimping thereto, comprising said means being formed of a conductive base-metal whose surface for engaging said wire is at least in substantial part an integral, continuous, thin, frangible, conductive, intermetallic compound layer less than about 300 micro inchese thick, said layer being composed solely of metals.

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**3,895,852**

**SLOTTED PLATE TYPE ELECTRICAL CONNECTIONS**

**Henry George Wasserlein, Jr., Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.**

**Continuation of Ser. No. 257,897, May 30, 1972, abandoned. This application Jan. 24, 1974, Ser. No. 436,292**

**Int. Cl. H01r** *9/08*

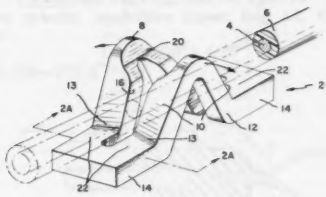
**U.S. Cl. 339—99 R** **5 Claims**

1. An electrical and mechanical connection between a conductor and a terminal member,

said terminal member comprising a plate-like member of conductive sheet metal, said member being bent transversely of its length at a location spaced from one end thereof to define an end section and a conductor-receiving side section

a wire-receiving slot extending into said conductor-receiving side section and extending for the full length of said side section and into said end section, said slot having a dead end in said end section,

said conductor being wedged in, and extending transversely through, said slot in said side section only, portions of said side section on each side of said slot being flexed outwardly and away from each other to provide a first spring system maintaining edge portions of said slot in engagement with said conductor, and




portions of said end section on each side of said slot being torsionally stressed in opposite rotary directions to provide a second spring system maintaining said edge portions of said slot in engagement with said conductor.

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**3,895,853**

**ELECTRICAL CONNECTOR**

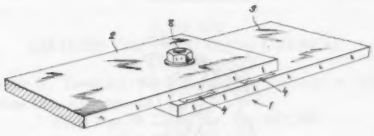
**Rudolf Neidecker, Basel, Switzerland, assignor to Multi-Contact A.G., Basel, Switzerland**

**Filed Aug. 29, 1973, Ser. No. 392,517**

**Claims priority, application Germany, Sept. 1, 1972, 2243034**

**Int. Cl. H01r** *7/08*

**U.S. Cl. 339—272 R** **7 Claims**




1. An electrical connector for electrically interconnecting two surfaces, said connector comprising a planar conductive metal sheet having a pair of generally coplanar longitudinally extending and longitudinally corrugatedly contracted side portions, the extended lengths of said side portions exceeding the length of said sheet along said side portions, and a plurality of parallel transverse resilient tongues extending between said portions and twisted from the plane of said portions, said tongues having ends joined to said sides and middle regions wider than said ends, said side portions being uniformly corrugated over their entire lengths and having more than one corrugation per tongue.

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**3,895,854**

**CHROMATIC METHOD AND APPARATUS FOR CONDUCTING MICROSCOPIC EXAMINATIONS AT A PLURALITY OF MAGNIFICATIONS**

**Garret Francis Ziffer, Natick, Mass., assignor to Coulter Electronics, Inc., Hialeah, Fla.**

**Filed Oct. 18, 1973, Ser. No. 407,536**

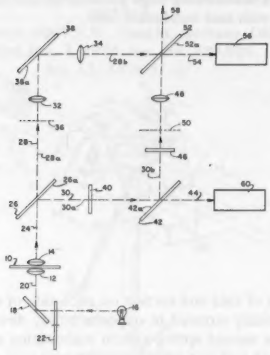
**Int. Cl. G02b** *21/00*

**U.S. Cl. 350—20** **23 Claims**

1. A chromatic method of conducting microscopic examinations of an illuminated object at a plurality of magnifications, in which neither the object nor any magnifying lenses are required to be moved, which comprises the steps of:

illuminating the object with a plurality of different colors of light,

conducting the light transmitted by said object along different paths for said different colors, and



producing different degrees of magnification along said different paths.

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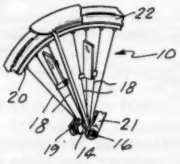
**3,895,855**

**END-VIEWABLE, SPOKE-MOUNTABLE REFLECTOR**

**Robert L. Nagel, Skokie, Ill., assignor to Beatrice Foods Company, Elgin, Ill.**

**Filed Dec. 26, 1973, Ser. No. 427,990**
**Int. Cl.[2] G02B** *5/12*
**U.S. Cl. 350—99** **9 Claims**



1. An assembly for producing a light flashing effect comprising in combination

A. a rotatable wheel member having a wheel axis, and a center plane generally perpendicular to said wheel axis,

B. a reflector unit having at least one region comprised of transparent solid material and having a region axis normal thereto, said region having formed therein at least two groups of cube corner reflector elements, all such elements each having a central optical axis, the respective such optical axes of such elements in each such group being disposed substantially parallel to the respective such optical axes of the other such elements in each such group, the respective optical axes of such elements in one such group being generally parallel to said region axis, the respective optical axes of such elements in a second such group being inclined at a predetermined angle relative to said region axis, said region being retro-reflective of light directed thereon over an angle extending from at least about 45° on one side of said region axis to at least about 30° on an opposed side of said region axis measured in a measurement plane containing said region axis and said predetermined angle,

C. said reflector unit being adapted for functional association with a side portion of said wheel member so that said region axis is generally perpendicular to said wheel axis, and

D. mounting means to mount said reflector unit fixedly to said wheel member in such association,

E. said wheel member, said reflector unit and said mounting means coacting together so that, when said wheel member is rotated, said reflector unit is adapted to produce a flashing light signal viewable at any spatial position relatively remote from said assembly within a viewing angle extending from not less than said center plane to at least about 45° on one side of said center plane once during each 360° of rotation of said wheel member.

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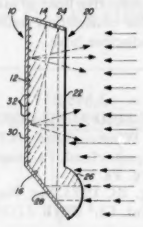
**3,895,856**

**REFLECTIVE APPARATUS**

**Quentin D. Bickel, 204 S. Papaga Cir., Tempe, Ariz. 85281**

**Filed Aug. 15, 1974, Ser. No. 497,570**
**Int. Cl.[2] G02B** *5/00*
**U.S. Cl. 350—104** **19 Claims**



1. Reflective apparatus, comprising, in combination:

lens means, including a convex portion for gathering light and a planar portion disposed adjacent said convex portion;

reflector means, including a back portion disposed substantially parallel to the planar portion of the lens means, a portion disposed at an obtuse angle with respect to the back portion and adjacent the convex portion of the lens means, and a portion disposed at an acute angle with respect to the back portion for reflecting light rays from the obtuse angle portion; and

facet means for receiving and reflecting light rays from the planar portion of the lens and from the acute angle portion of the reflector means.

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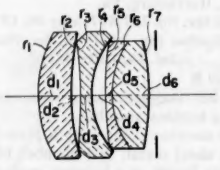
**3,895,857**

**BEHIND-STOP TESSAR TYPE PHOTOGRAPHIC LENS SYSTEM**

**Toshihiro Imai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed June 24, 1974, Ser. No. 482,762**
**Claims priority, application Japan, June 26, 1973, 48-72410**
**Int. Cl. G02b** *9/20*
**U.S. Cl. 350—227** **1 Claim**



1. A behind-stop Tessar type photographic lens system comprises three lens components of four lenses, a first lens component being a positive meniscus lens with its convex surface positioned on the object side, a second lens component being a biconcave lens and a third lens component being a cemented doublet lens comprising a negative meniscus lens

and a biconvex lens, said behind-stop Tessar type photographic lens system having the following numerical data:

| $f = 1$ | | | |
|---|---|---|---|
| $r_1 = 0.348$ | $d_1 = 0.110$ | $n_1 = 1.78590$ | $\nu_1 = 44.24$ |
| $r_2 = 0.888$ | $d_2 = 0.033$ | | |
| $r_3 = -1.436$ | $d_3 = 0.040$ | $n_2 = 1.67270$ | $\nu_2 = 32.10$ |
| $r_4 = 0.304$ | $d_4 = 0.037$ | | |
| $r_5 = 1.617$ | $d_5 = 0.023$ | $n_3 = 1.60717$ | $\nu_3 = 40.34$ |
| $r_6 = 0.281$ | $d_6 = 0.117$ | $n_4 = 1.75700$ | $\nu_4 = 47.89$ |
| $r_7 = -0.691$ | | | |

In the above, reference symbols $r_1$ through $r_7$ respectively represent radii of curvature of respective surfaces of lenses, reference symbols $d_1$ through $d_6$ respectively represent thicknesses of respective lenses and airspaces between lenses, reference symbols $n_1$ through $n_4$ respectively represent refractive indexes for $d$-line of respective lenses, and reference symbols $\nu_1$ through $\nu_4$ respectively represent Abbe's numbers of respective lenses.

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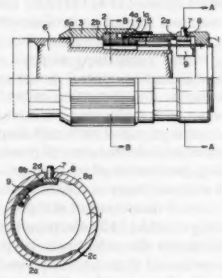
**3,895,858**

## LENS BARREL

**Hiroshi Sawano, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed July 25, 1974, Ser. No. 491,850**
**Claims priority, application Japan, July 30, 1973, 48-84959**
**Int. Cl. G02b 7/02**
**U.S. Cl. 350—255** **7 Claims**



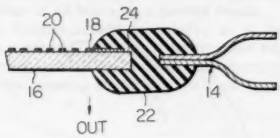
1. A lens barrel comprising
a. a focus ring having a first helicoid thread,
b. a lens frame having a second helicoid thread engaging with said first helicoid
c. guide means to guide said lens frame without any angular displacement upon operation of said focus ring,
d. means for stopping said lens frame to define a position where said lens frame is located for infinite-distance-focusing, and
e. a manually operable member for releasing said stopping means from the stopping state to make said lens frame movable beyond said position.

**3,895,859**

## GLARE-REDUCING WINDOW PANE AND AUTOMOTIVE WINDOW ARRANGEMENT USING THE PANE

**Fumio Yoshida, Tokyo; Setsuo Sakamoto, Yokohama, and Shoichi Tatewaki, Tokyo, all of Japan, assignors to Nissan Motor Company Limited and Central Glass Company Limited, both of Yokohama, Japan**

**Filed Dec. 11, 1973, Ser. No. 423,753**
**Claims priority, application Japan, Dec. 12, 1972, 47-142000**
**Int. Cl. G02b 5/20**
**U.S. Cl. 350—276 R** **3 Claims**




1. In a glare-reducing window assembly, wherein a sheet of transparent glass having on its one surface a number of spaced opaque film pieces is fitted in a window frame encompassing the glass and having a portion lying upon a peripheral area of said one surface of the glass, the combination with said glass and said window frame, of an opaque film strip formed on and extending along said peripheral area of said one surface of the glass, said film strip being so arranged that the film strip extends toward the center of the glass beyond said portion of the window frame whereby the window frame is made invisible by the film strip to a viewer observing the opposite surface of the glass.

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**3,895,860**

## METHOD FOR COMPARING CORNEAL MEASUREMENTS

**Malcolm G. Townsley, Park Ridge, Ill., assignor to Wesley-Jessen Inc., Chicago, Ill.**

**Filed Apr. 8, 1974, Ser. No. 459,106**
**Int. Cl. A61b 3/00**
**U.S. Cl. 351—39** **5 Claims**

1. A method for ascertaining changes in corneal dimensions, comprising the steps of:
a. measuring a corneal meridian at a first point in time to obtain a first set of data defining said corneal meridian;
b. generating a reference curve from said first set of data;
c. tabulating the differences between said first set of data and said reference curve;
d. storing said tabulated differences and said reference curve;
e. measuring the corneal meridian at a subsequent point in time to obtain a second set of data;
f. regenerating said reference curve; and
g. tabulating the differences between said reference curve and said second set of data.

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**3,895,861**

## REAR-SCREEN WIDE-ANGLE ON-AXIS PROJECTION SYSTEM

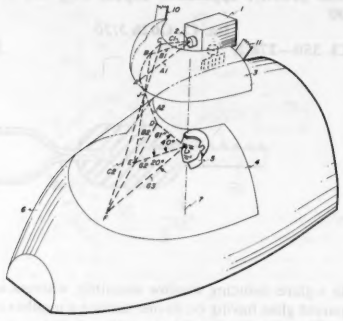
**John W. Herndon, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sept. 13, 1974, Ser. No. 505,448**
**Int. Cl. G03b 29/00**
**U.S. Cl. 352—69** **4 Claims**

1. A wide-angle on-axis projecting and viewing display system comprising:
a. a rear projection display screen having a rear convex side and front concave side,

b. projector means having a wide-angle lens for projecting image light rays,

c. a reflector means for receiving and redirecting said rays to the rear side of said rear projection screen for image observation from a viewing point in spaced relation from and on said front side of said screen,



d. the relative curvatures of said reflector and screen means being selected in relation to each other and to said screen viewing point to cause the image rays to pass through a common point which is the mirror image of said screen viewing point and hence provide on-axis viewing of the projected image.

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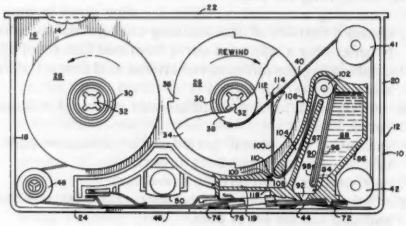
**3,895,862**

## PROCESSING FLUID RELEASE DEVICE AND METHOD FOR MULTIPURPOSE FILM CASSETTES

**Joseph A. Stella, Peabody; Edward F. Burke, Jr., Reading, and Paul B. Mason, Magnolia, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 26, 1973, Ser. No. 428,377**
**Int. Cl. G03c** *11/00*
**U.S. Cl. 352—130** **30 Claims**




1. In a film cassette containing a strip of photographic film to be exposed and processed without removal from the cassette, processing means also contained in the cassette and having a processing fluid reservoir initially sealed by a tear-tab to be removed by advancement of the tear-tab upon completion of film exposure so as to release reservoir contained processing fluid for deposit on the film strip, the improvement comprising:

a pull-strip joined at one end to said tear-tab; and

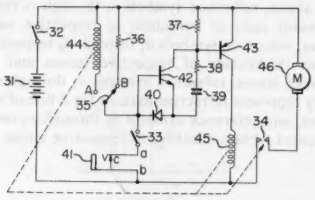
means for guiding said pull strip along a predetermined path to advance said tear-tab and release the processing fluid from said reservoir and for separating said pull strip from said tear-tab following release of the processing fluid.

**3,895,863**

## ELECTROMAGNETIC RELEASE DEVICES FOR CAMERAS

**Teiji Hashimoto, Kawasaki; Tomoshi Takigawa, and Toshikazu Ichiyanagi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 6, 1974, Ser. No. 439,906**
**Claims priority, application Japan, Feb. 12, 1973, 48-17156; Feb. 12, 1973, 48-17157; Feb. 12, 1973, 48-17158**
**Int. Cl. G03b** *21/38*
**U.S. Cl. 352—176** **26 Claims**




1. A photographic camera comprising:

a motor for operating said camera, said motor rotating upon receipt of current supplied from an electric power source housed in said camera;

shutter control means (**114, 115***c*) for controlling operation of a shutter, said shutter control means being actuated by a driving force from said motor when said motor rotates; blocking means comprising stopper means (**115***b*) provided on said shutter control means rotating in cooperation therewith, and actuating means (**109**) selectively movable between a blocking position at which said actuating means is engaged with said stopper means so that operation of said shutter control means is stopped and an unblocking position at which said actuating means is not engaged with said stopper means so that operation of said shutter control means is not stopped;

first switching means (**112**) electrically connected in series with said motor for selectively supplying current from said source to said motor, said first switching means being mechanically linked with said actuating means so as to supply current from said source to said motor when said actuating means is at its unblocking position;

electromagnet means (**108**) having at least first and second electromagnet circuits (**124, 125—FIG. 20**), said electromagnet means being located in a position from which said actuating means is magnetically affectable thereby, so as to control the movement of said actuating means;

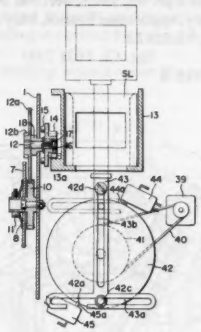
second switching means (**103**) for inhibiting supply of the current from said source to said second electromagnet circuit when said first switching means is activated, said second switching means being mechanically linked with said actuating means, and electrically connected so as to switch said second electromagnet circuit selectively into and out of parallel connection with said first electromagnet circuit;

whereby power dissipation in the utilization of said camera is reduced.

## 3,895,864
## OPTICAL PROJECTOR CAPABLE OF RANDOM ACCESS AND REPEAT PROJECTIONS

**Masanori Uchidoi, Kawasaki, and Tateo Yamada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 26, 1972, Ser. No. 318,653**
**Claims priority, application Japan, Dec. 29, 1971, 46-1239**
**Int. Cl. G03b** *23/04*
**U.S. Cl. 353—25** **40 Claims**



1. A slide film projecting system capable of random access projection comprising:
   a. slide film holding means for holding a plurality of slide films;
   b. drive means operative upon energization to drive said slide film holding means along a predetermined path to a slide delivery position where a selected slide film can be set for projection;
   c. detecting means for detecting the address of the one of said slide films located in said slide delivery position during the operation of said drive means to produce an electrical signal representing the detected address of the slide film in the delivery position;
   d. selector means for inputting a digital signal representing an address of a desired slide film for random access projection, said selector means comprising at least one array of switching members each having one terminal connected to a common connection and being arranged to connect said common connection to one or more code busses which are fewer in number than the switching members of one of said array, and
   e. control circuitry connected to said drive means for actuating said drive means to place the desired slide film into the slide delivery position, said circuitry comprising a plurality of signal holding means each individual to one of said code busses, said signal holding means being operable to hold the electrical signal produced by the selector means during a complete operation of said driving means irrespective of the operating condition of said switching members after said switching members were once operated.

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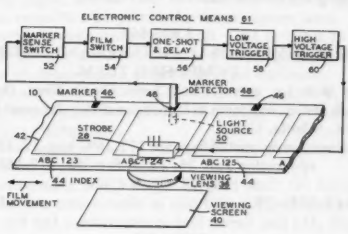
## 3,895,865
## HIGH SPEED MICROFILM SEARCHING SYSTEM

**Burton Kaufman, New York, and Bruce H. Schneider, Forest Hills, both of N.Y., assignors to General Computing Corporation, New York, N.Y.**

**Filed Feb. 11, 1974, Ser. No. 441,049**
**Int. Cl.[2] G03B** *21/10, 25/00*
**U.S. Cl. 353—26** **17 Claims**

9. A microfilm searching system comprising:
   a. microfilm moving means for rapidly moving microfilm from one reel to another;
   b. microfilm projecting means mounted in the film path between the reels and near to the microfilm for clearly displaying a desired frame on a viewing screen when the microfilm movement is stopped;
   c. an optically displayable index, comprising a plurality of characters, on each of a plurality of frames of the microfilm;
   d. a detectable marker on each of said plurality of frames of the microfilm;
   e. triggerable light source means mounted in the film path between the reels and near the microfilm for optically displaying as a stationary picture, when triggered, at least one character of an index on a passing frame;
   f. electronic control means responsive to a detectable marker on a passing frame for triggering said triggerable light source means so that at least one character of the index on that passing frame may be read by a human reader;




   g. film control means adapted to be operated by a human reader for slowing the movement of the microfilm so that more of the characters of the index on a passing frame may be read and for stopping the microfilm when the desired frame is located and projectable on the viewing screen;
   h. said electronic control means comprising:
      i. optical switch means for generating a marker signal when a marker is detected;
      ii. one-shot & delay means responsive to a marker signal for generating a triggering signal; and
      iii. trigger means responsive to a triggering signal for generating a trigger pulse for triggering said triggerable light source means;
   i. said one-shot & delay means when set by a marker signal not resetting for a given period of time so that subsequent marker signals detected during said given period of time do not trigger such triggerable light souce means;
   j. said given period of time being about 20 microseconds.

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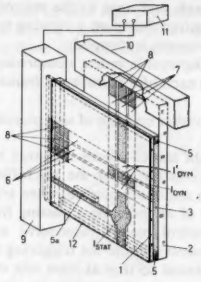
## 3,895,866
## INFORMATION-BEARING DEVICES AND PROJECTION DISPLAY SYSTEMS THEREFOR

**Alfred de Quervain, Zurich, and Peter Wild, Wettingen, both of Switzerland, assignors to Brown, Boveri & Cie AG, Switzerland**

**Filed Nov. 29, 1972, Ser. No. 310,263**
**Claims priority, application Switzerland, Dec. 3, 1971, 17591/71**
**Int. Cl. G03b** *21/26*
**U.S. Cl. 353—30** **31 Claims**

1. A unitary, optically projectable, composite transparency having an electrically variable, optically readable information content and arranged to be interposed between a projector and a display means, the transparency comprising a first portion bearing static optical information, said first portion including distinct indicia, a second portion bearing dynamic information in intimate contact with the first portion and

including a liquid crystalline substance having regions whose optical states can be selectively changed, and control means

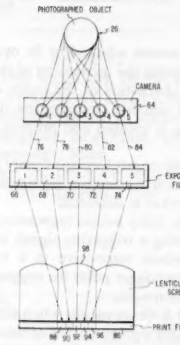


coupled to the liquid crystalline substance for selectively changing the optical states of the regions.

## 3,895,867
## THREE DIMENSIONAL PICTURES AND METHOD OF COMPOSING THEM

**Allen Wah Lo, Atlanta, and Jerry Curtis Nims, Dunwoody, both of Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.**

**Continuation-in-part of Ser. No. 171,269, Aug. 12, 1971. This application July 16, 1973, Ser. No. 379,388**
**Int. Cl. G03b** *35/24*
**U.S. Cl. 355—77** **15 Claims**




**1.** A method of composing an image array of the type containing a multiplicity of lineiform image bands which afford an overall image of an object field when viewed through a lenticular screen having a corresponding multiplicity of lenticules aligned with the lineiform image bands, comprising the steps of:

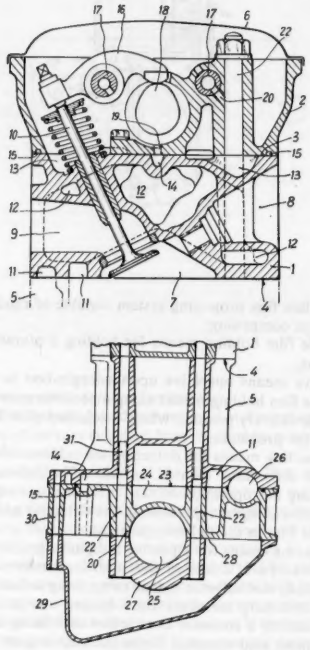
exposing a photosensitive surface underlying a composing lenticular screen of lenticule width *w* at a number N of spaced locations beneath such lenticule to respective ones of N projected images of elements of N two-dimensional recorded images of an object field, said two-dimensional recorded images being projected onto the composing lenticular screen with the projected image of a selected element of each recorded image in registry with a reference point, thereby to record on the photosensitive surface beneath each lenticule N lineiform images of a portion of the object field separated by unexposed areas of the photosensitive surface; and

exposing each unexposed area to a projected image of the same element of the same two-dimensional recorded image projected in recording an adjacent one of said N lineiform images by effecting sufficient relative movement between the path of projection of said projected image of said same element and the photosensitive surface to cause the projected image of said same element to fall upon at least a portion of said unexposed area.

## 3,895,868
## STRUCTURE OF INTERNAL COMBUSTION ENGINES

**Armand Castarède, Billancourt, France, assignor to Regie Nationale des Usines Renault, Paris and Automobiles Peugeot, Billancourt, both of, France**

**Filed Apr. 30, 1973, Ser. No. 355,422**
**Claims priority, application France, May 5, 1972, 72.16134; June 23, 1972, 72.22822**
**Int. Cl. F02f** *7/00*
**U.S. Cl. 123—195 R** **12 Claims**



**1.** Internal combustion piston engine structure comprising assembled cast elements, namely a cylinder block, a cylinder head, a valve-gear case and an oil return sump, characterised in that said elements are stacked in planes parallel to the cylinder head gasket, each element receiving separately in the form of pre-assembled sub-assemblies the mechanical components inherent thereto, the stacking of said sub-assemblies being held by a series of common studs having an intermediate screw-threaded portion engaging corresponding tapped holes of the cylinder block, said studs extending through rough-cast holes formed in the other elements of the assembly.

## 3,895,869
## HEADING SENSOR WITH COMPENSATION WINDINGS

**Richard W. Lewis, Derby, Kans., assignor to The Boeing Company, Seattle, Wash.**

**Filed June 17, 1974, Ser. No. 480,055**
**Int. Cl. H01f** *3/00*
**U.S. Cl. 335—296** **6 Claims**

**1.** A magnetic heading sensor suitable for use in a ferrous environment to sense magnetic heading with respect to the

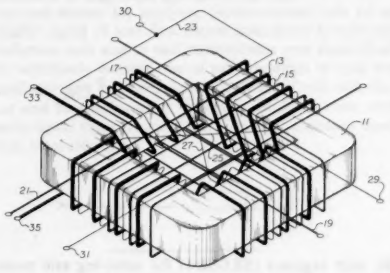
earth's magnetic field vector, said magnetic heading sensor comprising:

a square core formed of a magnetically permeable material, said square core defining two sets of parallel legs lying orthogonal to each other;

an excitation winding wound about at least one leg of said square core for electrically exciting said square core into and out of magnetic saturation when said excitation winding is connected to a suitable electrical excitation source;

a first sense winding wound about one of said sets of parallel legs so as to sense the change in the earth's magnetic field passing through said square core when said excitation winding is excited by a suitable electrical excitation source;

a second sense winding wound about the other of said sets




of parallel legs so as to sense the change in the earth's magnetic field passing through said square core when said excitation winding is excited by a suitable electrical excitation source;

a first compensation winding, wound about said square core, said excitation winding and said first and second sense windings so as to encompass said square core, said excitation winding and said first and second sense windings along a first axis; and,

a second compensation winding wound about said square core, said excitation winding and said first and second sense windings so as to encompass said square core, said excitation winding and said first and second sense windings along a second axis lying orthogonal to said first axis.

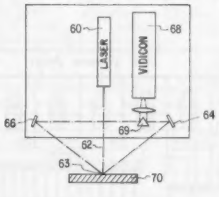
## 3,895,870
## LASER DIMENSION COMPARATOR

**Donald L. Cullen, and Teddy L. Moore, both of Columbus, Ohio, assignors to Autech Corporation, Columbus, Ohio**

**Continuation-in-part of Ser. No. 148,466, June 1, 1971, Pat. No. 3,796,492. This application Jan. 15, 1973, Ser. No. 323,786The portion of the term of this patent subsequent to Mar. 12, 1991, has been disclaimed.**

**Int. Cl. G01c** *3/00*

**U.S. Cl. 356—1** **12 Claims**




1. A laser dimension comparator for providing an electrical output indicative of a distance dimension of a workpiece comprising a laser light source for directing a single beam of coherent light onto a workpiece to produce a single laser light intensity gradient on the surface of said workpiece, a photo detector positioned adjacent said source, a pair of light directors on opposite sides of said beam for forming a pair of spaced backscatter light intensity gradients on the face of said photo detector from the gradient on said workpiece, and an electrical circuit coupled to said photo detector for producing an electrical output signal indicative of the position of said images on the face of said photo detector.

## 3,895,871
## ELECTRONIC TACHYMETER

**Georg Strasser, Rebstein, Switzerland, assignor to Wild Heerbrugg Aktiengesellschaft, Heerbrugg, Switzerland**

**Filed Oct. 25, 1972, Ser. No. 300,596**

**Claims priority, application Switzerland, July 21, 1972, 10940/72**

**Int. Cl. G01c** *3/08*

**U.S. Cl. 356—4** **14 Claims**

1. In a tacheometer structure assembly having

a transit unit (**31, 33, 34**) for optical measurement of surveying angles, and movably mounted for rotation, and tilt about respective perpendicular measurement axes,

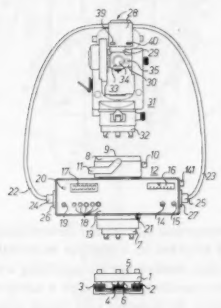
an electronic measuring head unit (**28**) secured to and rotatable with said transit unit to obtain signals representative of distance of a target from said structure;

an electronic console unit (**12**) including circuit components to evaluate the signals and to compute and display distance information;

and a base support unit (**1**) adapted to be positioned with respect to a reference marker;

the improvement comprising a support shaft (**8**) having a central axis connectable to said base support unit (**1**) at one end and connectable to said transit unit (**31, 33, 34**) at the other end;

means (**9, 32**) centering said transit unit on said central axis; said electronic console unit being rotatably secured to




and surrounding said support shaft (**8**), located intermediate of the base support unit (**1**) and the transit unit (**31, 33, 34**) and rotatable about said central axis,

and signal transmission means (**22, 23**) interconnecting the radiation head unit (**28**) and the electronic console unit.

## 3,895,872
## OPTICAL SPEED-MEASURING DEVICES AND METHODS FOR MAXIMIZING THEIR ACCURACIES

**Rene Dandliker; Paul Iten, both of Oberrohrdorf, and Baldur Eliasson, Birmensdorf, all of Switzerland, assignors to Brown, Boveri & Company Ltd., Switzerland**

**Filed Jan. 29, 1973, Ser. No. 327,694**

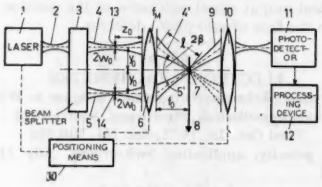
**Claims priority, application Switzerland, Jan. 31, 1972, 1316/72**

**Int. Cl. G01p** *3/36*

**U.S. Cl. 356—28** **24 Claims**

1. In an optical speed-measuring device, where two laser light beams are directed from at least one laser onto a measur-

ing volume, and Doppler measuring means responds to the reflected light to determine the speed of the volume, and wherein the laser light beams emerging from the laser before being directed onto the measuring volume each exhibit a




minimum spot radius, the method of adjusting the accuracy of the speed measurement, which comprises directing the beams onto the measuring volume and locating said minimum spot radii to conicide with the measuring volume.

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**3,895,873**

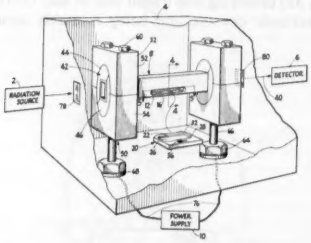
## SPECTROSCOPIC ANALYSIS APPARATUS UTILIZING A TUBULAR HEATING ELEMENT AND A PASSIVE SAMPLE HOLDER

**Allan G. Dennison, Acton, Mass.; Martha F. Bancroft, Amherst, N.H.; Stanley B. Smith, Jr., Westford, and Marc Joshua Tolkoff, Boston, both of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.**

**Filed Apr. 4, 1974, Ser. No. 457,798**

**Int. Cl. G01j** *3/02*

**U.S. Cl. 356—85** **19 Claims**




**1.** In a spectroscopic system for determining the quantity of a substance of interest in a sample material, said system including a radiation source for transmitting a radiation beam at a characteristic wavelength through a sample location, and a radiation detector for sensing said beam after transit through the sample location, sample excitation structure comprising:

a tubular heating element positioned at said sample location, said heating element having a longitudinal axis aligned with said radiation beam, the ends of said heating element being transparent to said beam, an access opening in a longitudinal wall of said heating element, and a heating surface adjacent said access opening,

a sample holder insertable into said heating element through said access opening, said sample holder including a sample receiving surface for receiving sample material and a heat transmitting surface that nests in intimate heat transfer contact with said heating surface of said heating element when the holder is inserted into said heating element, and

structure for applying an energizing signal to said heating element of sufficient intensity to generate heat for conductive transmission from said heating surface through the nested heat transmitting surface of said sample holder to excite said sample material on said sample receiving surface to an atomic state.

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**3,895,874**

## CIRCUIT FOR GENERATING SYNC PULSES FOR USE IN DETECTING OUTPUT SIGNALS OF SPECTROPHOTOMETER OR THE LIKE

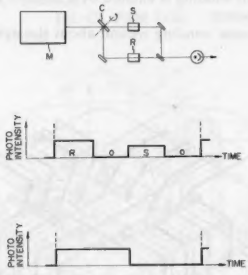
**Yutaka Ogiwara, Niiza, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Mar. 19, 1974, Ser. No. 452,522**

**Claims priority, application Japan, Mar. 26, 1973, 48-33470; Mar. 26, 1973, 48-33471**

**Int. Cl. G01j** *3/42*

**U.S. Cl. 356—93** **5 Claims**




iii. shift registers (**SR1-SR4**) for receiving said pulse (h), and having a number of outputs capable of being shifted to the following stages during one rotation of said chopper (c); and

**1.** A circuit for generating sync pulses for use in detecting the output signals of a measuring instrument such as a double-beam spectrophotometer using a chopper which is rotated in response to the electrical signal, said circuit comprising:

i. means (PG, Di–1) adapted to generate a first clock pulse (*b*) in synchronism with said electrical signal,

ii. means adapted to generate one pulse (*h*) whose pulse duration equals that of said first clock pulse for each revolution of said chopper (*c*),

iv. means adapted to select and synthesize the outputs of said shift registers (**SR1-SR4**) contained in the components (R,S,O) of said output signal (*a*) of said measuring instrument which components are to be separated from each other.

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**3,895,875**

## DIGITAL INDICATOR FOR CAMERAS

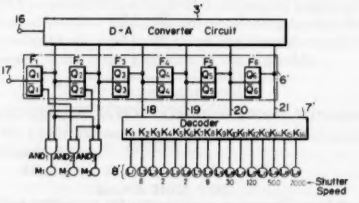
**Mashio Kitaura; Koutaro Yata, and Seiji Yamada, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan**

**Filed Aug. 31, 1973, Ser. No. 393,585**

**Claims priority, application Japan, Aug. 31, 1972, 47-101938**

**Int. Cl. G01j** *1/44*

**U.S. Cl. 356—226** **12 Claims**




**1.** A digital display for a camera for providing an indication of an exposure condition with respect to the level of illumina-

tion of an object being viewed comprising, in combination:

a. a light measuring circuit responsive to the illumination of the object viewed for producing an analog signal affording an exposure condition measurement;

b. first means for converting the analog signal of said light measuring circuit into a corresponding plural bit digital signal;

c. a main indicator unit including a first plurality of radiation emitting elements for selectively indicating corresponding exposure condition values in accordance with a given exposure condition measurement;

d. a subindicator unit including a second plurality of radiation emitting elements for indicating a subinterval value of the exposure condition between the exposure condition measurement indications of corresponding, adjacent elements of said main indicator unit; and

e. second means for applying predetermined bits of said digital signal of said first means selectively to said main indicator unit and to said subindicator unit respectively, to selectively actuate one of said elements of said main indicator unit and one of said elements of said subindicator unit for display of an exposure condition value and a subinterval value, respectively, for each exposure condition measurement.

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**3,895,876**

## QUANTIZED INDICATION APPARATUS

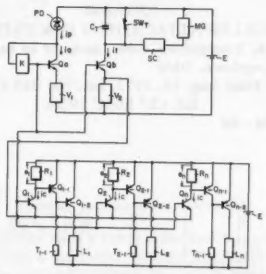
**Chiharu Mori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 286,988, Sept. 7, 1972, Pat. No. 3,828,253. This application Sept. 10, 1973, Ser. No. 395,660**

**Claims priority, application Japan, Sept. 11, 1972, 47-91030**

**Int. Cl. G01j** *1/44*

**U.S. Cl. 356—226** **10 Claims**



**1.** Apparatus for providing a quantized indication of a parameter that varies in relation to a variable input signal which comprises:

a logarithmic compression circuit including a controllable voltage source providing a first voltage and control means responsive to the signal for controlling the controllable voltage source so that the first voltage varies in logarithmic relationship with respect to variations in the signal;

a plurality of logarithmic expansion circuits each including a voltage-controlled current source controlled by the first voltage and each having an inverse-logarithmic voltage-in to current-out transfer characteristic; and

indicating means including a plurality of threshold-detecting switching elements respectively corresponding to the plurality of expansion circuits, each switching element having a different threshold and being operative to switch between opposite switching conditions in accordance with whether the current out of its corresponding expansion circuit is on one side or the other of its threshold.

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**3,895,877**

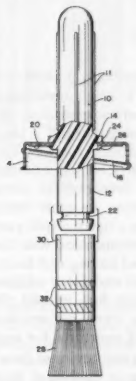
## APPLICATOR BRUSH AND METHOD OF MAKING SAME

**Kenneth A. Fomby, c/o K & D Tooling & Machine, 402 Lindsay St., Gainesville, Tex. 76240**

**Filed Mar. 5, 1973, Ser. No. 338,384**

**Int. Cl. A46b** *3/02, 11/00*

**U.S. Cl. 401—129** **2 Claims**



**1.** A method of making an applicator brush for a container, comprising the steps of;

a. providing a mold cavity having a portion to receive plastic to integrally form a handle and a stem portion, which stem portion is to receive a brush thereon,

1. introducing molding material into the mold cavity,

2. said stem portion and said handle portion being integrally molded with a container cover positioned within the length of said handle portion and said stem portion,

b. providing a brush for attachment to the end of said stem portion,

1. providing said cover with a central aperture, with at least a portion of the aperture being non-circular so the moldable plastic introduced through the non-circular aperture will extend therethrough to lock said cover against rotational movement with respect to the handle, and

2. forming a boss of plastic integrally with said stem and said handle on each side of said container cover to restrain the cover against relative longitudinal movement with respect to the handle and the stem.

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3,895,878

## COUPLING ELEMENT HAVING A SPLIT HUB

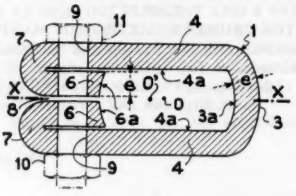
Alfred Pitner, Paris, France, assignor to Nadella S.A., France, a part interest

Continuation of Ser. No. 792,915, Jan. 22, 1969, abandoned. This application Feb. 29, 1972, Ser. No. 230,361

Claims priority, application France, Jan. 30, 1968, 68.137889; Nov. 7, 1969, 69.172874

Int. Cl. B60b *27/06*

U.S. Cl. 403—344 10 Claims




1. An assembly comprising a shaft, a sheet of sheet metal stock in the shape of a tube constituting a coupling element comprising a hub closely surrounding said shaft and having a substantially C-section shape and a longitudinal axis and at least one extension portion extending from the hub, said hub including two lateral ears, each ear comprising an end portion of said sheet and an intermediate portion of said sheet in parallel adjacent relation to each other, said end portions defining between them a narrow split putting the inside of the C-section hub in communication with the exterior in a plane containing said axis and having end faces in contact with said shaft in regions of said end faces adjacent said split so as to retain said shaft in said hub in said plane, means defining apertures in said two ears, nut-and-bolt tightening means extending through said apertures for urging said ears toward each other, the hub having an inner face comprising a keying face means and a face on said shaft having substnatially the same cross-sectional shape as said keying face means and in close-fitting relation to said keying face means.

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3,895,879

## COMBINED POST TENSIONING ANCHOR AND CABLE

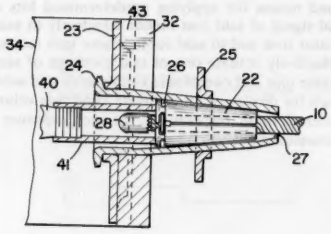
Frederick W. Burtelson, Lombard, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Division of Ser. No. 38,247, May 18, 1970, Pat. No. 3,762,027. This application June 6, 1973, Ser. No. 367,380

Int. Cl.[2] F16B *7/04*

U.S. Cl. 403—369 2 Claims

1. A cable and dead anchor assembly for use in post-tensioned concrete comprising an anchor sub-assembly and a pre-cut length of cable, said anchor sub-assembly comprising a tapered shell open at both ends and having a flange at its larger end, a reaction plate having an aperture therein, said tapered shell being received in said aperture with said flange engaging said reaction plate, a tapered jaw cluster disposed within said shell and comprising circumferentially disposed jaws, a removable closure cap disposed within the shell at its larger end, and a cable extending through the smaller end of said shell and being disposed centrally of said jaw cluster, and terminating short of said closure cap, the jaws of said jaw cluster being equally spaced from the larger end of the shell




in permanent wedging engagement with said cable and with the inner surface of said shell, said permanent wedging engagement being of a type that is formed by a push-developed axial pressure imposed from an external power source against the larger end of the jaw cluster and in a direction toward the smaller end of the shell and substantially uniformly on said jaws so that each jaw engages said cable with substantially the same gripping force and subsequent movement of the cable in the jaws is prevented during handling and vibration incident to curing of the concrete, said anchor sub-assembly and said precut length of cable being a separate transportable structure.

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3,895,880

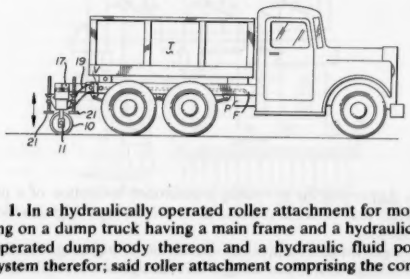
## ROLLER ATTACHMENT FOR TRUCKS

Robert Fink, Youngstown, Ohio, assignor to Inglis Nurseries, Inc., Youngstown, Ohio

Filed Aug. 15, 1973, Ser. No. 388,480

Int. Cl.[2] E01C *19/26*

U.S. Cl. 404—86 1 Claim




1. In a hydraulically operated roller attachment for mounting on a dump truck having a main frame and a hydraulically operated dump body thereon and a hydraulic fluid power system therefor; said roller attachment comprising the combi-

nation of a transverse beam attached to the truck main frame at a point below the rear end of the dump body, said beam consisting of an elongated I-beam, side and end pieces sealingly attached to the opposite sides and ends thereof so as to reinforce the same and form a liquid holding tank thereabout, a vertically positioned hydraulic cylinder and piston ram secured to each end of said transverse beam, a roller positioned between and journeled on said rams below said cylinders and movable toward and away from said transverse beam on the vertical axes of said hydraulic cylinders and transverse beam, means in said hydraulic fluid power system communicating with said hydraulic cylinders and valve means in said communication means for controlling hydraulic fluid with respect to said hydraulic cylinders.

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**3,895,881**

**TOOL-CARRIERS WITH RETRACTABLE TOOL-BITS**

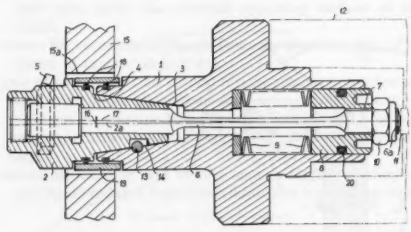
**Christian Charles Langlois, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France**

**Filed Mar. 29, 1973, Ser. No. 346,038**

**Claims priority, application France, Apr. 10, 1972, 72.12465**

**Int. Cl. B23b *47/00***

**U.S. Cl. 408—156** **8 Claims**



**1.** A tool carrier with a retractable tool bit, comprising; a tool carrier body, a bit holder member displaceably mounted with respect to said tool carrier body in order to cause the tool bit to pass from a working position to a retracted position and vice-versa, in which the bit holder member and the tool carrier body have conical surfaces for centering said carrier body and said bit holder member in a position in an axis on which said carrier body and said bit holder member are displaceable, a rod rigidly fixed to said bit holder member and in which the extremities of the rod are arranged substantially along said axis, and restoring means in said body tending normally to return said conical surfaces to the centering position, said rod being subjected to said restoring means, said rod being further subjected in the centering position to a bending stress which tends to cause said bit holder member to move radially closer to said axis when said carrier body and said holder member are displaced from their centering position by the action of an external force.

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**3,895,882**

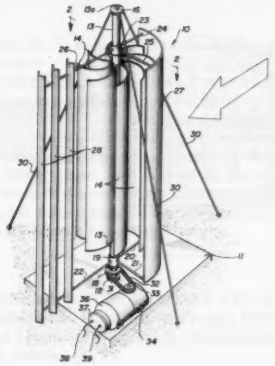
**WINDMILL STRUCTURE**

**Robert D. Moyer, c/o B. & J. Distributors, R.R. 1, Box 39, Star City, Ind. 46985**

**Filed Apr. 17, 1974, Ser. No. 461,632**

**Int. Cl.² F03D *7/06***

**U.S. Cl. 415—2** **7 Claims**



**1.** In a windmill structure for converting wind energy to mechanical energy, the combination comprising: a base structure, thrust bearing support means formed in said base structure for rotatably receiving the bottom end of a vertically disposed shaft, a shaft member positioned within said base structure with the bottom end thereof journaled within said thrust bearing support means, a plurality of wind-engaging blades secured to and extended from said shaft member, a thrust bearing plate member positioned at the upper end of said shaft, support means secured to said thrust bearing plate means to support said shaft, whereby rotation of said shaft is obtained by said plurality of wind-engaging blades, shield means first and second spaced apart collars rotatably secured to said shaft below and above said wind-engaging blade means, means extending from said collars to said shield means for supporting said shield means, and directional wind vane means extending from said collars to rotate said shield means to be predominantly facing the direction of the wind, said directional vane comprises a pair of spaced apart rods secured to and extending from said collar means, and a plurality of substantially parallel vertically disposed vane members being substantially triangular in configuration with the apex thereof receiving said rods therethrough, said vertically disposed vane members are triangular in configuration and have the concave

portion thereof directed toward said shaft, whereby said wind-engaging blades extended from one side of said vertical shaft engage the wind and wind-engaging blades extending on the opposite side of said shaft, behind shield means, are free of impingement from the wind, whereby the effective overall efficiency of said wind-engaging blades is increased.

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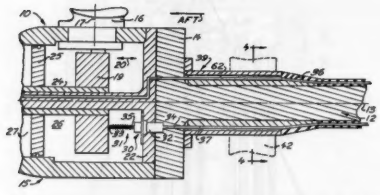
**3,895,883**

## PROPELLER PITCH INDICATOR

**James Miller Pedersen, 3809 Puget Dr., Vancouver, British Columbia, Canada**

**Filed Oct. 29, 1973, Ser. No. 410,343**
**Int. Cl. B63h** *3/00*
**U.S. Cl. 416—61** **10 Claims**



**1.** A propeller pitch indicator for indicating pitch of a controllable pitch propeller of a marine vessel at a station remote from the propeller, the propeller having a hub, a hub datum, and a pitch reflecting means of the hub movable relative to the hub datum to reflect pitch of the propeller, the propeller being mounted on a tailshaft journalled for rotation relative to the vessel, the indicator including:

a. a sensor cooperating with the hub to rotate therewith, the sensor including a precision sheathed control link having a longitudinal axis disposed generally parallel to the tailshaft and being capable of transmitting force in both directions along the axis, the link having a sheath and a control rod, the sheath enclosing the control rod and having an outer end secured relative to the hub and the shaft, and an inner end supported radially relative to the tailshaft to rotate therewith, portions of the sheath remote from the outer end thereof being permitted to move axially relative to the tailshaft; the control rod having an outer end cooperating with a stylus engaging the pitch reflecting means, and an inner end responsive to movement of the stylus,

b. a position transducer cooperating with the inner end of the sensor and adapted to rotate therewith, the transducer having a resistance member coupled to an electrical power source so as to conduct electrical current to produce an electrical potential drop across the resistance member, and a movable contact member adapted to sweep the resistance member so as to provide a variable potential at the contact member proportional to position of the contact member relative to the resistance member, the contact member cooperating with the sensor so as to be responsive to position of the stylus relative to the hub datum so that the contact member is at an electrical potential dependent on position of the stylus, so that output from the transducer reflects position of the pitch reflecting means,

c. a galvanometer adapted to be fitted in the vessel remote from the hub so as to be stationary relative to the vessel, the galvanometer being connected to output from the contact member and the electrical power source and being responsive to current from the contact member, which current is dependent upon pitch of the propeller, the galvanometer being adapted to indicate pitch of the propeller,

d. a rotary contact unit cooperating with the shaft, the unit connecting electrically the galvanometer and the electrical power source to the position transducer.

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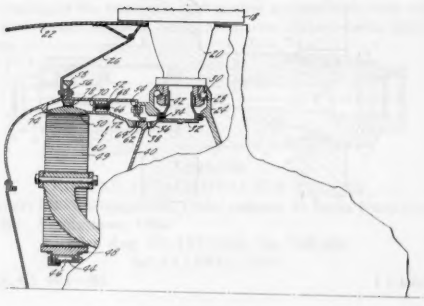
**3,895,884**

## TORQUE SENSITIVE PITCH LOCK

**Merritt B. Andrews, Westfield, Mass., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed July 5, 1974, Ser. No. 486,023**
**Int. Cl.[2] B64C** *11/34*
**U.S. Cl. 416—153** **4 Claims**



**1.** For a fan propulsor having a hub rotatably supporting a plurality of circumferential blades mounted therein for pitch change movement, means including a rotary actuator having connection means connected to said blades for imparting pitch change movement, a pitch lock element on said connection means and movable therewith, a retractable pitch lock element normally urged out of engagement with said pitch lock element and means responsive to the blades when they are extracting energy out of the airstream for engaging said

pitch lock elements to prevent the pitch from going to a lower blade angle.

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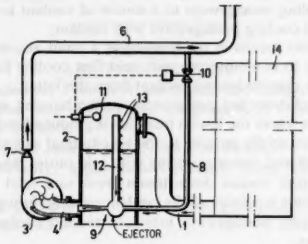
## 3,895,885
## EMPTYING SYSTEM FOR FLUID TANKS

**Lars-Olof Liberg, Gothenburg, Sweden, assignor to Jonkopings Mekaniska Werkstads AB, Jonkoping, Sweden**

**Filed Jan. 3, 1973, Ser. No. 320,828**
**Claims priority, application Sweden, Jan. 12, 1972, 303/72**
**Int. Cl. F04b** *23/04, 23/08*
**U.S. Cl. 417—54** **13 Claims**




10. Apparatus for emptying a container for liquid, such as a cargo oil tank, comprising a liquid container, a centrifugal pump which has an inlet, a pump impeller and a pressure pipe, for emptying said container, a suction pipe connecting said container to said pump, a separator tank which is interconnected in said suction pipe between said container and said pump for separating gas from the liquid on its way from said container to said pump,

means for mixing gas which is present in an upper portion of the separator tank, in a diffused form into recirculated liquid, said means being separate from and not forming a part of said separator and disposed in a bottom portion of said tank below the normal operating surface of said liquid,

means for recirculating liquid from the pressure pipe of the pump to said mixing means,

pipe means connected to said mixing means and extending into said upper portion of said separator tank wherein said gas is contained for conducting said gas from said separator tank and introducing it into said mixing means, and

means attached to said mixing means, for introducing the gas-liquid mixture thus created into the inlet of the pump.

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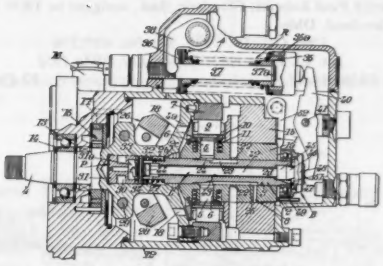
## 3,895,886
## DEVICE FOR CORRECTING THE DELIVERY OF A DISTRIBUTING INJECTION PUMP AND PUMP EQUIPPED THEREWITH

**Jean Leblanc, Lyon, France, assignor to Societe Industrielle Generale de Mecanique Applique S.I.G.M.A., Venissieux, France**

**Filed Apr. 23, 1973, Ser. No. 353,533**
**Claims priority, application France, May 8, 1972, 72.16432**
**Int. Cl. F04b** *49/00*
**U.S. Cl. 417—284** **9 Claims**

1. Device for correcting the delivery per revolution of a distributing rotary injection pump for an internal combustion engine, which pump comprises a first fixed body member and a rotary distributor located inside said body and driven by a second substantially coaxial drive shaft member which itself is driven by the engine supplied by the pump, said pump comprising at least one pumping piston disposed in a transverse bore formed in one of said first and second members, a cam borne by the other of said first and second members for slidingly driving said piston, the fixed body member being provided with distributing channels which lead to the supply injectors of the engine and which cooperate with the distributing passages borne by the rotary distributor and are capable of communicating with said bore, said distributing passages being inclined to the longitudinal direction of the distributor so that a longitudinal displacement of this distributor causes the delivery per revolution of the pump to vary, thrust means, flexible return means, stop means, and a regulator sensitive to the rotary speed of the drive shaft member for controlling the said longitudinal displacements of the distributor so that said longitudinal displacements are subjected to the action of the



regulator by said thrust means, and to the opposing action of said flexible return means through the action of said stop means cooperating with said distributor, second flexible return means being provided between the distributor and said thrust means, said device also comprising linking means for linking the thrust means and the distributor and for linking the thrust means and the stop means so that longitudinal movement of the thrust means with respect to the stop means causes longitudinal movement of the distributor with respect to the stop means, said linking means being mounted so as to rotate freely with respect to said stop means.

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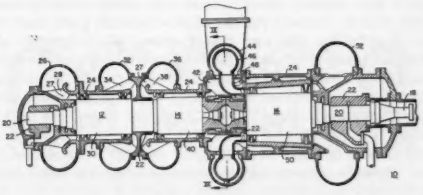
## 3,895,887
## GAS TURBINE FOR USE IN A CLOSED CYCLE PLANT

**Hermann Finckh, Boxdorf, and Martin Trabler, Grossdechsendorf, both of Germany, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed June 12, 1973, Ser. No. 369,331**
**Claims priority, application Germany, June 16, 1972, 2229510**
**Int. Cl. F04b** *17/00*
**U.S. Cl. 417—408** **3 Claims**



1. A gas motive fluid utilizing machine arrangement including:

at least one turbomachine member,

said turbomachine member having an axis,

said turbomachine member being enclosed by a generally coaxial rigid housing.

said turbomachine member having at least one generally annularly shaped conduit disposed generally outside of and adjacent said rigid housing,

said generally annularly shaped conduit being disposed around at least one end of said turbomachine, said conduit providing ingress or egress for said motive fluid,

a plurality of orifices in registration between said conduit and said rigid housing, said orifices being generally deformed by a plurality of axially aligned ribs disposed generally radially inwardly of said conduit, said ribs providing directional guidance for said motive fluid, said ribs also being in a supportive relationship between said housing and said axis for the maintenance of rigidity in said housing, said orifices providing means for passage of gaseous fluid therethrough.

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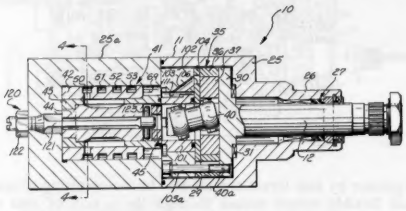
**3,895,888**

## HYDROSTATIC CONTROL UNIT

**Maurice Paul Roberts, Otterbein, Ind., assignor to TRW Inc., Cleveland, Ohio**

**Filed Oct. 19, 1973, Ser. No. 407,776**
**Int. Cl. F01c** *1/02*; **B62d** *5/00*; **F04c** *1/02*
**U.S. Cl. 418—61 B** **22 Claims**



1. A control unit comprising: metering means for metering fluid flow and including first and second toothed members disposed in meshing engagement with one another; input means for rotating said first member relative to said second member; a changeover valve means for directing fluid flow to one of alternative flow paths and movable between a neutral position and first and second oppositely disposed operating positions in response to torque applied thereto by said second member for directing the metered flow of fluid from said metering means to one of said alternative flow paths.

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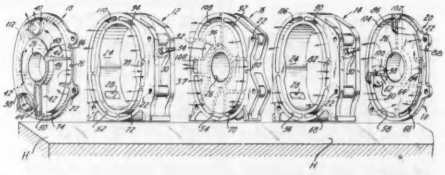
**3,895,889**

## LIQUID COOLING SYSTEM FOR ROTARY INTERNAL COMBUSTION ENGINE

**Robert W. Loyd, Jr., Wyckoff, and Charles Lombaerde, Ridgewood, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.**

**Filed Mar. 4, 1974, Ser. No. 447,916**
**Int. Cl. F01c** *21/06*; **F02b** *55/10*
**U.S. Cl. 418—83** **4 Claims**



1. In a rotary internal combustion engine in which a rotor is eccentrically mounted on a mainshaft so that the rotor planetates within a multi-lobed, substantially trochoidal shaped cavity formed within the housing of the engine and which engine is disposed in its normal operative position with the major and minor axes of the cavity respectively extending substantially vertically and parallel to a horizontal plane and wherein combustion occurs in the area adjacent one of the lobe junctures so that the area of highest heat flux extends substantially along one side of the housing parallel to the major axis of said cavity, a cooling system for the housing of said engine comprising:

a. a plurality of first cooling passageways in the housing adjacent the area where the highest heat flux is produced and extending substantially parallel to the longitudinal axis of said mainshaft;

b. header means forming chambers in the housing at the opposite ends of said housing to connect said first cooling passageways together end-to-end to provide for series flow of coolant through each of said plurality of first cooling passageways from one end of the housing to the other and upwardly adjacent said area of highest heat flux;

c. inlet means in the housing at a point below the minor axis of the trochoidal cavity and adjacent the combustion exhaust gas discharge means to communicate said first cooling passageways to a source of coolant to supply the first cooling passageways with coolant;

d. outlet means in the housing at a point above the minor axis to communicate with said first cooling passageways and receive heated coolant from the latter;

e. second cooling passageways in the housing adjacent the area where the lowest heat flux is produced and extending substantially parallel to the longitudinal axis of the mainshaft and communicating with said outlet means; and

f. by-pass means downstream from said inlet means for passing a portion of the coolant passing through said first cooling passageways into said second cooling passageways.

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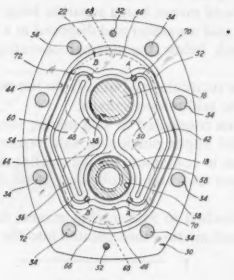
**3,895,890**

## GEARED HYDRAULIC APPARATUS

**Roger Laumont, Nogent-sur-Marne, France, assignor to Hydroperfect-International H P I, Chennevieres sur Marne, France**

**Filed Jan. 24, 1974, Ser. No. 436,240**
**Int. Cl. F04c** *27/00*
**U.S. Cl. 418—132** **5 Claims**



1. A geared hydraulic apparatus comprising:

a body defining a central recess, covers secured to opposite ends of said body to close the ends of said recess, and an outer gasket between each cover and its respective end of said body for providing a fluid-tight seal between said body and each cover, said body having fluid inlet and discharge ports,

two spaced apart side plates within said recess, each side plate being adjacent to one of said covers,

two cooperating toothed wheels within said recess and mounted on shafts rotatably supported in bearings carried by said side plates,

three gaskets arranged between the inner face of each cover, on the one hand, and its respective side plate and body end, on the other hand, said gaskets all being surrounded by said outer gasket and including two spaced apart inner gaskets and an intermediate gasket surrounding said inner gaskets,

said inner gaskets surrounding two independent regions connected to the inlet and discharge ports, respectively,

of said body, said inner gaskets defining between them a region of low pressure connected to means for lubricating the shaft bearings, said intermediate gasket defining between itself and said outer gasket a region of intermediate pressure connected to said recess, and said intermediate gasket defining a passageway between itself and each of said inner gaskets,

a blind hole in each side plate opening toward its respective cover, and a plug arranged to slide in fluid-tight manner within said hole, and

means for urging said plug toward said cover to seal said low pressure region from the one of said passageways adjacent to the one of said inner gaskets surrounding a high pressure region.

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**3,895,891**

## VANE-TYPE MACHINE

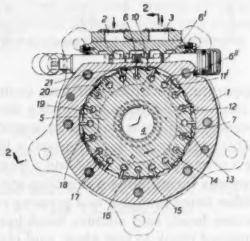
**Ludwig Budecker, Frankfurt am Main, and Lothar Kunze, Langenhain, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.**

**Filed June 11, 1973, Ser. No. 368,781**

**Claims priority, application Germany, June 12, 1972, 2228506**

**Int. Cl. F01c** *19/08;* **F03c** *3/00;* **F04c** *15/00*

**U.S. Cl. 418—133** **4 Claims**



1. A vane-type machine comprising a housing enclosing a plurality of working chambers communicating with either a pressuremedium inlet or a pressure-medium outlet, a lateral disc sealing one side of the working chambers, a counter-pressure pocket assigned to each working chamber to enable equalization of pressure on both sides of the lateral disc, said counter-pressure pockets being located alternately on both sides of a partition wall located between the lateral disc and the housing of the vane-type machine, and means coupling said counter-pressure pockets to respective pressure-medium inlets and pressure-medium outlets to provide equalization pressure to the respective pockets.

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**3,895,892**

## OIL SEAL MEANS OF A ROTARY ENGINE

**Yoshio Sasaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan**

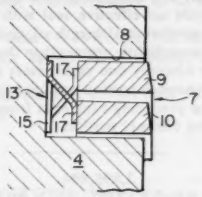
**Filed Nov. 9, 1973, Ser. No. 414,216**

**Claims priority, application Japan, July 18, 1973, 48-80284**

**Int. Cl. F04c** *27/00*

**U.S. Cl. 418—142** **6 Claims**

1. An oil seal means of a rotary engine comprising a plurality of oil seal rings disposed one over the other and mounted in a common annular oil seal groove formed at a side wall portion of a rotor, said annular oil seal groove containing a bottom wall and spring means adapted to resiliently urge each of said oil seal rings independently and axially outwardly of the rotor, characterized in that said spring means includes a substantially flat base portion to seat upon the bottom wall of said annular oil seal groove and a plurality of spaced spring portions extending from opposite edges of said base portion and inclined with respect to said base portion, said spring



portions each supporting only one of said plurality of oil seal rings.

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**3,895,893**

## ROTARY PISTON PUMP

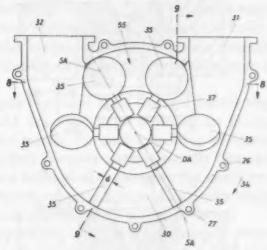
**Manfred Sommer, Talstrasse D-7101, Outergruppenbach, Germany**

**Filed Dec. 4, 1972, Ser. No. 311,816**

**Claims priority, application Germany, Dec. 3, 1971, 2160162; Austria, Nov. 2, 1972, 9332/72**

**Int. Cl. F01c** *1/00, 21/00;* **F04c** *1/00*

**U.S. Cl. 418—153** **21 Claims**



1. A rotary piston pump comprising a casing having an annular channel therein, a hub rotatable in said casing concentric with said annular channel, said hub comprising a shaft portion rotatably supported in said casing and an overhanging annular flange portion at an inner end of said shaft portion and having a central space inside said shaft portion and having a central space inside said annular flange portion, said flange portion being disposed wholly radially inwardly of said annular channel of the casing, means providing a fluid tight seal between said hub and said casing, means for rotating said hub, a plurality of circumferentially spaced generally radial shafts extending through and rotatably supported by said annular flange portion of said hub, a flat circular disc-shaped vane mounted on the outer end of each of said shafts and disposed in said annular channel whereby upon rotation of said hub, said vanes are carried around in said annular channel, said channel having an arcuate pumping portion of uniform circular cross section corresponding in size to said circular vanes and a sealing portion of restricted cross section corresponding in size and shape to the diametrical cross section of said vanes, inlet and outlet openings at the opposite ends respectively of said pumping channel portion and means for cyclically controlling the rotational orientation of said vanes in said channel to hold said vanes at least approximately perpendicular to the direction of movement while passing through said pumping channel portion and to position said vanes in line with said direction of movement for passage through said sealing channel portion, said controlling means comprising portions of said shafts extending inwardly to said central space inside said annular flange portion of said hub, an eccentric portion on the

inner end of each said shaft and actuating means acting cyclically on said eccentric portions to orientate said vanes, the peripheral edge of each of said vanes in cross section being of spherical curvature and being formed of resilient non-metallic material to provide an effective seal with the wall of said channel, the circumferential length of said sealing channel portion being at least slightly greater than the spacing between successive vanes whereby one vane enters the upstream end of said sealing channel portion sufficiently to form a seal therein before the preceding vane exits from the downstream end of said sealing channel portion.

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**3,895,894**

## DEVICE FOR GENERATING HIGH PRESSURES AND TEMPERATURES

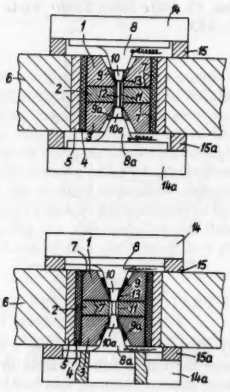
**Klaus Biermann; Jürgen Burbach; Horst Gimpel, and Burckhard Zirpins, all of Essen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany**

**Filed Apr. 23, 1973, Ser. No. 353,738**

**Claims priority, application Germany, Apr. 26, 1972, 2220349**

**Int. Cl. B29c *11/00*; B29f *5/00***

**U.S. Cl. 425—77** **10 Claims**



**1.** A device for generating high pressures and temperatures, which includes in combination: a high-strength metallic pressure container comprising a pressure chamber adapted to receive a tubular member of plastically deformable and electrically insulating material with a charge of material to be compressed therein, two oppositely located conical piston ram means arranged in axial alignment with each other and with said pressure chamber and movable toward and away from each other and said pressure chamber for respectively compressing a charge of material in a tubular member received in said pressure chamber and relieving the thus compressed charge, electric current conveying means electrically connected to said piston ram means for heating a charge to be compressed received in said pressure chamber, said pressure chamber being defined by at least two axially aligned annular members of high strength hard metal, pressure resistant insulating material interposed between and electrically insulating said annular members from each other, annular fitting means surrounding said annular members, additional pressure resistant mica insulating means permanently interposed durably between the outer periphery of said annular members and the inner peripheral surface of said fitting means and electrically insulating the same from each other, and strong metallic sealing means arranged between said piston ram means and at least the respective adjacent one of said annular members.

**3,895,895**

## DEVICE FOR TRANSFERRING PRESSINGS TO BE SINTERED FROM A PRESS PRODUCING THEM FROM POWDER MATERIALS, TO A SINTERING SUPPORT

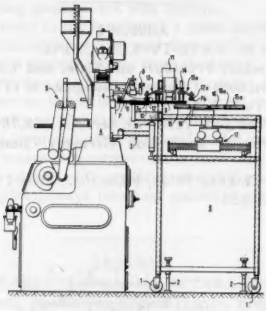
**Harald Märker, Kochel am See, and Josef Leingärtner, Bad Heilbrunn, both of Germany, assignors to Dorst-Keramikmaschinen-Bau Inh. Otto Dorst u. Dipl.-Ing. Walter Schlegel, Kochel am See, Germany**

**Filed Sept. 19, 1973, Ser. No. 398,762**

**Claims priority, application Germany, Sept. 20, 1972, 2246048**

**Int. Cl. B65g *47/91***

**U.S. Cl. 425—78** **2 Claims**



**1.** In an apparatus for transferring an unsintered pressed blank for a sintered part from a pressing die to a support holding the pressing while it is sintered, a forming press having a die; a movable carriage for said support; a lifter; a transfer means having a primary suction head and a transfer plate; said lifter having means for gripping a pressing and lifting it from the die; said lifter being movable to a pressing release position over said suction head; said suction head being adapted to transfer the pressed blank to said plate; said plate being rotatably mounted and means for rotating the same in 180° increments; means for coordinating the operation of said die, suction head and transfer plate; said transfer plate having a secondary suction lifter mounted thereon; means forcing said suction lifter to lower when said suction lifter is over said support and to release the suction grip on a pressing when the suction lifter has been lowered; means for moving said carriage in synchronization with said press and secondary suction lifter whereby the pressings are deposited on said support in a close packed prearranged pattern.

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**3,895,896**

## APPARATUS FOR PULTRUDING HOLLOW OBJECTS

**Roger B. White, Shaker Heights; David E. Pearson, Hudson, and Hugo E. Birkner, Jr., Kent, all of Ohio, assignors to The Pultrusions Corporation, Kent, Ohio**

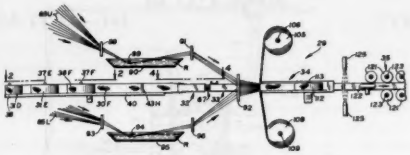
**Division of Ser. No. 303,648, Nov. 3, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,701**

**Int. Cl. B29d *23/05***

**U.S. Cl. 425—93** **15 Claims**

**1.** Apparatus for the continuous manufacture of articles having upper, lower and laterally displaced peripheral walls and having hollow cavities therethrough, separated by at least one internal web wall, from fiber reinforced, thermosetting resin comprising: a die having a throat to delineate the exterior configuration of the hollow article, at least two mandrels positioned within the throat of said die to delineate the configuration of said hollow cavities and at least one said internal web wall through the article, creel means to supply a plurality of dry ribbons of fiber matting, means for directing said ribbons along and between opposing sides of said mandrels, a forming guide to incorporate each said ribbon of dry matting

into at least three of said article walls and including a first turning vane to fold at least one of said ribbons directly over one said mandrel and downstream of said first vane a second turning vane to fold another of said ribbons over and in the opposite direction to said first folded ribbon and completely enclose at least one of said mandrel to form at least one said hollow cavity prior to contact with the thermosetting resin, an



exposure chamber to receive the dry folded mat ribbons from said forming guide and deposit an amount of resin on a portion of said folded ribbons that is at least sufficient to impregnate all ribbons of matting with resin, means continuously to draw said mat ribbons from said creel means, along said means for directing, through said forming guide and exposure chamber and between said mandrel and die, and means to heat said die.

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**3,895,897**

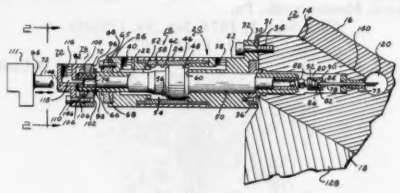
## BLOW NEEDLE ASSEMBLY

**Joseph F. Hudson, Royal Oak, Mich., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Mar. 4, 1974, Ser. No. 447,472**

**Int. Cl. B29d** *23/03*

**U.S. Cl. 425—182** **11 Claims**



**1.** In a molding machine of the type including a split mold associated with a blow needle assembly comprising cylinder means and elongated piston means including a piston rod reciprocable within said cylinder means and a hollow needle reciprocable in a bore opening into a cavity formed in a section of said split mold at an angle to the parting line thereof for puncturing and expanding tubular plastic material within the split mold, the improvement wherein said piston means comprises stem means including an elongated hollow stem extending through said piston rod having said blow needle at its forward end, said stem means being releasably secured to said piston rod at the end opposite that having said blow needle, whereby said blow needle may be removed from and replaced in said piston means without removing the piston rod therefrom.

**3,895,898**

## FLAT SHEET INJECTION HEAD FOR ROLLER-HEAD INSTALLATIONS

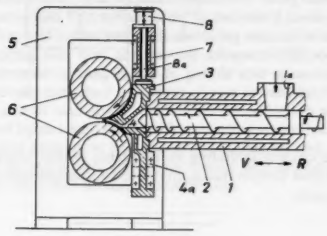
**Helmuth Theysohn, Wiehbergstrasse 25 C, 3 Hannover, Germany**

**Filed June 14, 1973, Ser. No. 369,846**

**Claims priority, application Germany, June 19, 1972, 2229828**

**Int. Cl. B29c** *15/00;* **B29f** *3/00*

**U.S. Cl. 425—325** **9 Claims**



**1.** Roller head apparatus comprising;

a calender stand; calender rolls rotatably supported by said stand and defining a nip between the rolls;

an extruder barrel; an extruder screw rotatable therein for the extruding of material in a plastic state from said barrel;

an elongate injection head for said barrel aligned with said nip, said injection head defining an elongate flat sheet extruder nozzle for said extruding of material and comprising two elongate parts generally disposed on opposite elongate sides of said elongate flat sheet extruder nozzle; rigid means mounted on said calender stand and extending along said elongate injection head;

means supporting a first of said elongate parts of said injection head mounted stationary on said rigid means, the other of said elongate parts of the injection head being mounted on said barrel and being movable therewith toward and away from said calender stand and rolls; and pressure means mounted on said rigid means for acting between the same and said movable elongate part of the injection head for releasably pressing this part toward said stationary elongate part, in portions of said parts including at least a central portion thereof, to counteract distortion of said movable elongate part in the use of the apparatus.

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**3,895,899**

## EXTRUSION DIE

**Herbert Weber, Effretikon, Switzerland, and Alfred Wagner, Steisslingen, Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland**

**Filed Mar. 26, 1973, Ser. No. 344,481**

**Claims priority, application Switzerland, Mar. 30, 1972, 4784/72**

**Int. Cl. B29f** *3/08*

**U.S. Cl. 425—378 R** **10 Claims**

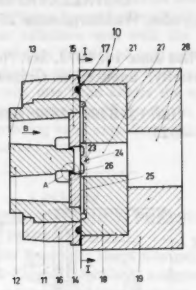
**10.** An extrusion die having a die body, for use in the manufacture of sections of metallic materials,

said body including a portion composed of a certain material defining a working surface region,

said body further defining a conduit for a coolant in good thermal conductive communication with said working surface region,

said working surface region comprising a layer of diffusion products of said body material and

a coating disposed on said layer,



said coating including an inorganic binder resistant to elevated temperatures, metallic substances and solid lubricants.

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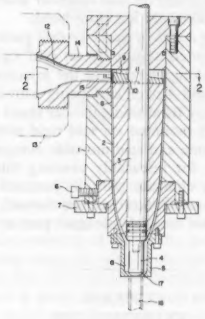
**3,895,900**

## PLASTICS EXTRUSION DIE HEAD IMPROVEMENT

**Albert J. Herold, Bedford; Paul E. Koch, Chagrin Falls, and Richard C. Adams, Chardon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**

**Filed Feb. 21, 1974, Ser. No. 444,341**
**Int. Cl. P29d** *23/04*
**U.S. Cl. 425—466** **2 Claims**



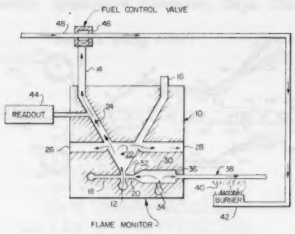
**1.** In an extrusion blow molding die head comprising a die body equipped with a removable die bushing, said die body having an internally, somewhat generally conical hollow area fitted with a stationary tubular cone through which extends a movable internal shaft having a core pin which extends into and near the end of the opening in the die bushing said die body also having a fixed gap and a channel for plastic flow near an insert ring located at the top of said tubular cone, the improvement comprising an obstruction located at the bottom of the insert ring and extending about half the circumference of the tubular cone in the area where the plastic enters the channel for plastic flow.

**3,895,901**

## FLUIDIC FLAME DETECTOR

**Elmer L. Swartz, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Aug. 14, 1974, Ser. No. 497,413**
**Int. Cl.² F23N** *5/02*
**U.S. Cl. 431—77** **6 Claims**




**1.** A fluidic flame monitoring device comprising: a fluidic amplifier means having an inlet channel, an outlet channel, and a control port communicating with an interaction region such that a control signal applied to said control port modulates a power stream flowing between said inlet and output channels; readout means coupled to said outlet channel for providing an indication of the pressure therein; a chamber coupled to a fluid source and having an output connected to said control port to provide said control signal thereto, said chamber further incorporating a vented pressure regulating output; and means coupled to said pressure regulating output for controlling the amount of venting therethrough in response to the temperature of an external flame; whereby the pressure within said chamber is varied by said external flame and the power stream within said fluidic amplifier is thereby modulated and indicated.

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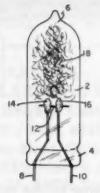
**3,895,902**

## PHOTOFLASH LAMP

**David R. Broadt, Lewisburg, and Donald E. Armstrong, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Montoursville, Pa.**

**Filed Sept. 9, 1971, Ser. No. 179,056**
**Int. Cl.² F21K** *5/02*
**U.S. Cl. 431—93** **4 Claims**



**1.** A photoflash lamp comprising:
an hermetically sealed, light transmitting envelope;
a combustion-supporting gas in said envelope;
a quantity of filamentary combustible material located within said envelope, said filamentary material comprising a plurality of strands having a length inversely related to the weight of said filamentary material, the density of said strands being sufficient to render said filamentary material self-supporting within said envelope, and said filamentary material being distributed within said envelope with the strands thereof most dense toward the center of said envelope and least dense at the walls of said envelope;

and ignition means attached to one end of said envelope and disposed in operative relationship with respect to said combustible material.

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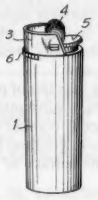
**3,895,903**
**DISCARDABLE LIGHTER**

Pierre Lefebvre, 55, rue de Turbigo, 75 Paris 3e, France

Filed Aug. 15, 1973, Ser. No. 388,643
Claims priority, application France, Apr. 17, 1973, 73.13885
Int. Cl.[2] F23Q 2/00
U.S. Cl. 431—143 3 Claims




1. A disconnectable housing for a lighter having a body and an igniting mechanism carried by said body and provided with a flame-generating serrated wheel, said housing comprising first and second cases, the first case being adapted to enclose said body and the second case being adapted to enclose said igniting mechanism, the second case including depending lugs positioned to be slidingly fitted with slight friction between the first case and said body to hold the lighter fast with respect to both said cases, the second case being provided with an opening for the passage of a flame and an opening for the flame-generating serrated wheel.

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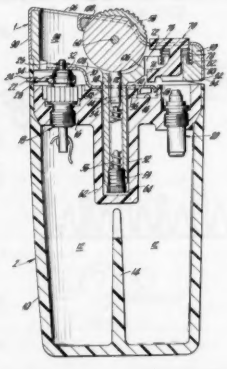
**3,895,904**
**BUTANE LIGHTER ASSEMBLY**

Everett L. Kimball, Stroudsburg, Pa., assignor to Ronson Corporation, N.J.

Filed Jan. 21, 1974, Ser. No. 434,782
Int. Cl.[2] F23Q 2/00
U.S. Cl. 431—143 12 Claims



1. A lighter assembly consisting essentially of a first and a second unitary modular subassembly detachably mounted together; said first modular subassembly comprising a hollow body portion defining a chamber for storing flammable fuel, an inlet valve assembly for inserting fuel into said chamber, a burner valve assembly for emitting fuel from said chamber, and a burner valve actuating arm for opening said burner valve assembly to effect emission of fuel therefrom; said second modular subassembly comprising a spark mechanism including flint means for igniting said fuel emitted from said burner valve assembly, a manually operable actuator button engaging said actuating arm to effect opening of said burner valve assembly and extending to the outer extremity of said lighter to be engaged by the thumb of a user, spring means for biasing said actuator bottom out of engagement with said actuating arm, and an integrally formed body portion having said spark mechanism and said actuator button operatively mounted thereupon, said second subassembly being formed to extend across said first subassembly to provide a cover member therefor; said lighter assembly including means for detachably mounting said first and second subassemblies together during operation of said lighter to enable said subassemblies to be manually detached to permit access to said inlet valve assembly and to said spark mechanism for refueling and reflinting said lighter, said detachable mounting means including detent means formed on one of said subassemblies and means located to cooperatively releasably engage said detent means formed on the other of said subassemblies.

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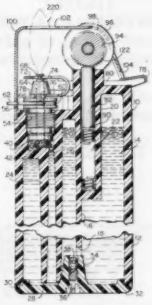
**3,895,905**
**LIGHTER**

Warren I. Nissen, Topsfield, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 9, 1973, Ser. No. 414,267
Int. Cl.[2] F23Q 2/16
U.S. Cl. 431—254 19 Claims



1. A lighter comprising fuel chamber defining structure having an outlet port, valve means for controlling the flow of fuel from said fuel chamber through said outlet port, said valve means including a first valve member and a second valve member mounted for movement between a valve closed position and a valve open position, a valve actuator for moving said movable member, said valve actuator being a one-piece member and including a first coupling portion secured to said first member, a second coupling portion juxtaposed to said first coupling portion and secured to said second member, a spring portion connecting said first and second coupling portions and normally urging said first and second coupling portions towards one another to move said first and second valve members towards said valve closed position, and an exposed surface portion at the end of said actuator remote from said coupling portions, and manually operated ignition means adjacent said exposed surface portion for operation in coordination with opening of said valve by said valve actuator in response to manual engagement of said exposed surface.

3,895,906

## HEATING PROCESS AND APPARATUS USING OXYGEN

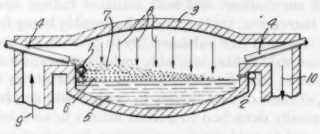
Robert Roy Kottmeier, Hamilton, Canada, assignor to Canadian Liquid Air Ltèe, Air Liquide Canada Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 342,397, March 19, 1973, abandoned. This application Mar. 18, 1974, Ser. No. 452,350

Claims priority, application United Kingdom, Mar. 24, 1972, 13937/72

Int. Cl. F23l *15/00*

U.S. Cl. 432—22 21 Claims



1. A method of heating a charge in a furnace having means forming an enclosed chamber disposed between a primary air and fuel inlet and an off-gas outlet, said chamber including means for containing a charge presenting an extensive surface to be heated, said chamber defining a surrounding enclosure containing a global atmosphere of primary air and fuel above the charge, in which method a flame is continuously propagated in said global atmosphere which is continuously renewed by primary air supplied to said primary air and fuel inlet and proceeds at a relatively low velocity above the surface of the charge towards said off-gas outlet from which off-gases are continuously withdran, comprising, the steps of:

continuously projecting over a substantial width of the chamber, below said primary air and fuel inlet between said global atmosphere and immediately over a major area of the surface of the charge, substantially parallel to said surface, an oxidizing gas containing at least 50% oxygen and thereby forming a continuously propagated, relatively highvelocity incandescent blanket of reacting gases having a width several times its thickness moving at a substantially greater velocity than that of said global atmosphere, and

controlling the respective supplies of primary air and oxidizing gas and maintaining a substantial velocity difference between the incandescent blanket and the global atmosphere forming a pressure gradient pressing the incandescent blanket against the surface of the charge.

3,895,907

## TURNBULL'S BLUE SINGLE BATH MINERAL DYEING PROCESS (FERRI-ZIRC) FOR CELLULOSIC TEXTILES

Charles James Conner, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 10, 1973, Ser. No. 404,974
Int. Cl. D06p *3/60*
U.S. Cl. 8—52 8 Claims

1. A mineral dyeing process for imparting a Turnbull's Blue coloration to cellulosic textiles, the process consisting of impregnating a cellulosic textile with an aqueous solution containing an inhibited reducing agent, ferric salt, and alkali metal ferricyanide, and zirconyl ammonium carbonate, then curing the impregnated cellulosic textile.

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3,895,908

## AUTOCLAVING PROCEDURE FOR TEXTILE FIBERS

Richard E. Harder, and Leland B. Ticknor, both of Williamsburg, Va., assignors to Dow Badische Company, Williamsburg, Va.

Filed Jan. 28, 1971, Ser. No. 110,644
Int. Cl. D06m *3/26*
U.S. Cl. 8—130.1 6 Claims

1. In the process for improving the physical properties of fibers comprising acrylonitrile polymers containing at least about 85 weight per cent of acrylonitrile and up to about 15 weight per cent of another polymerizable mono-olefinic monomer copolymerizable therewith, which process comprises contacting a mass of the fibers, while in an oriented state, with steam at a temperature of about 105° to 140°C, at a steam pressure of at least about 20 pounds per square inch in a closed chamber, the improvement therein comprising:

a. pretreating the fibers before their contact with steam by evenly distributing on the surface of the fibers at least about 5 weight per cent of water; and

b. ensuring complete penetration of the steam into all portions of the mass of fibers in the chamber.

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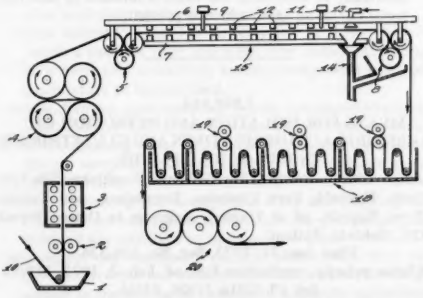
3,895,909

## PROCESS FOR THERMOSOL DYEING OF POLYESTER FABRICS

James E. Greer, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed June 6, 1973, Ser. No. 367,360
Int. Cl. D06p *3/52*
U.S. Cl. 8—176 3 Claims



1. In a process for dyeing, drying, thermosoling, washing and drying a polyester material, the improvement comprising thermosoling the polyester material in an infrared oven under tension and subsequently quenching the polyester after the thermosoling but before the polyester material contacts any holding or restraining roll.

3,895,910

## METHOD OF PROTECTING TIN-PACKAGING AGAINST CORROSION AND MAKING THEM GLOSSY

Romuald Juchniewicz, Gdansk, Poland, assignor to Politechnika Gdanska, Gdansk, Poland

Division of Ser. No. 267,983, June 30, 1972, Pat. No. 3,822,998, which is a continuation of Ser. No. 872,748, Oct. 30, 1969, abandoned. This application Oct. 11, 1973, Ser. No. 405,659
Claims priority, application Poland, Oct. 10, 1968, 129973
Int. Cl.[2] C23F *11/12, 11/14, 11/18*
U.S. Cl. 21—2.7 R 2 Claims

1. A method for preventing corrosion and imparting glossiness to tin-packings during the sterilization or pasteurization thereof with water, said method comprising adding to the water used in said sterilization or pasteurization, a mixture comprising (a) water glass; (b) an organic derivative having an anion in common with water glass; (c) a washing agent and (d) a brightening agent, the organic derivative being at least one organic silicate selected from the group consisting of 4-phenoxysilane, 4-butoxysilane, calcium silane, and aminoalkylpolysiloxanes.

2. A method for preventing corrosion and imparting glossiness to tin-packings during the sterilization or pasteurization thereof with water, said method comprising adding to the water used in said sterilization or pasteurization, a mixture comprising (a) sodium nitrite; (b) an organic derivative having an anion in common with sodium nitrite; (c) a washing agent and (d) a brightening agent, the organic derivative being at least one organic nitrite selected from the group consisting of dicyclohexylamine nitrite, diisobutylamine nitrite, piperidine nitrite and guanidine nitrite.

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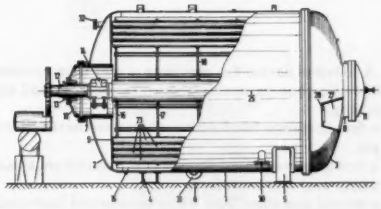
3,895,911

## CYLINDRICAL TANK STERILIZER

Antoon Adrianus Prins, Breukelen, Netherlands, assignor to Schiedamsche Werktuigenen Machinefabriek N.V., Schiedam, Netherlands

Filed Aug. 28, 1972, Ser. No. 284,251
Claims priority, application Netherlands, Aug. 27, 1971, 7111843
Int. Cl. A23l *3/02*
U.S. Cl. 21—98 4 Claims



1. In a sterilizer of the type having a cylindrical tank with a head on each end and a drum therein rotatable relative to the tank about its central axis for receiving objects to be sterilized such as cans, milk bottles or the like, the tank being provided with a sealable opening via which the drum can be charged or discharged, the improvement wherein the tank is arranged with its central axis substantiall horizontal and the sealable opening comprises:

a first opening disposed eccentrically in one of the heads of the tank and a second opening similarly disposed in the other head, in axial alignment with said first opening, each of said first and second openings comprising a plurality of object accommodating holes, having centers spaced along a straight line which is substantially horizon-

tal and perpendicularly intersects a vertical plane containing the rotation center line of the drum, at a given distance vertically from said rotation center line; and

said drum comprises a series of sets of tubular cages, each cage accommodating the objects end to end in a column with their longitudinal axes aligned, and with the center lines of all the cages in a set disposed parallel to the rotation center line of the drum and spaced in correspondence with the spacing of said holes along a straight line which perpendicularly intersects a radius drawn from the rotation center line of the drum, at said given distance, whereby through stepwise rotation each set of cages can be brought in line with the holes of the first and second openings at the same time so that the first opening may be used for loading a plurality of columns of objects to be sterilized into the drum while the second opening is used for simultaneously discharging a similar plurality of columns of sterilized objects from the drum.

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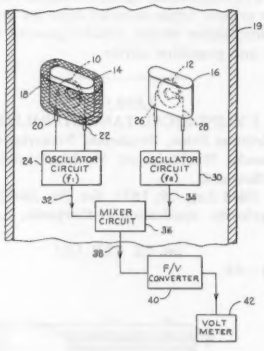
**3,895,912**

## CARBON MONOXIDE MONITOR

**Robert J. Naumann, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Nov. 6, 1974, Ser. No. 521,603**
**Int. Cl. G01n** *27/00, 31/10, 31/12*
**U.S. Cl. 23—255 E** **3 Claims**




1. A monitor device for providing a real time, continuous monitor of carbon monoxide concentration in a fluid stream comprising:

a. a first container filled with a pressurized heat conducting gas;

b. a first temperature sensitive crystal material encapsulated within said first container;

c. a second container filled with a pressurized heat conducting gas;

d. a second temperature sensitive crystal material encapsulated within said second container;

e. said first container being surrounded by a layer of hopcalite coating for reacting with the carbon monoxide, with said first crystal detecting the heat from said reaction;

f. a first oscillator circuit having a variable output frequency and having connected therein said first crystal for controlling said output frequency of said first circuit;

g. a second oscillator circuit having a variable output frequency and having connected therein said second crystal for controlling said output frequency of said second circuit;

h. said first and second oscillator circuits having matched output frequencies in the absence of carbon monoxide; and

i. circuit means for comparing said first oscillator circuit output frequency and said second oscillator circuit output frequency to obtain a single net output frequency signal and for converting said single net output frequency into a voltage signal which represents the concentration of carbon monoxide;

whereby the carbon monoxide in the fluid stream will react with said hopcalite coating giving off a heat of reaction to heat said first crystal changing the frequency of said first oscillator circuit to create a single difference in said comparing circuit means which is then converted to a voltage signal for providing a continuous readout of the concentration of carbon monoxide.

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**3,895,913**

## PHOTOMETRIC TEST METHOD FOR CHELANT RESIDUAL OR DEFICIENCY

**Edmund J. Bockowski, Hatboro, Pa., and Louis J. Stefanelli, Pennsauken, N.J., assignors to Betz Laboratories, Inc., Trevose, Pa.**

**Filed Sept. 6, 1974, Ser. No. 503,895**
**Int. Cl.[2] G01N** *31/22, 33/18*
**U.S. Cl. 23—230 R** **3 Claims**

1. A method of determining the amount of a first metal chelating agent relative to the level of magnesium, calcium and heavy metal ions in water, which comprises,

a. adding to a sample of said water a solution comprised of equimolar portions of a magnesium or calcium salt and a second chelating agent, said second chelating agent having a higher stability constant for heavy metal ions than the said first chelating agent; wherein the second chelating agent substitutes magnesium or calcium ions for the heavy metal ions in the water; and then,

b. adding to the sample a color indicator pre-complexed with magnesium or calcium ions, said pre-complexed color indicator being capable of reacting with calcium or magnesium ions in the water when said first chelating agent is present in an amount stoichiometrically less than that required to bind up all calcium and magnesium ions present, simultaneously generating a characteristic color, and said pre-complexed color indicator capable of yielding calcium and magnesium ions where said first chelating agent is present in an amount equal to or greater than the stoichiometric amount required to bind up all calcium and magnesium ions present, thus generating another characteristic color; then,

c. measuring the absorbance of the generated color photometrically to determine the relative amount of said first metal chelating agent which is present.

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**3,895,914**

## MEANS FOR ISOLATION AND DETECTION OF BARBITURIC ACID DERIVATIVES AND GLUTETHIMIDE IN BIOLOGICAL FLUIDS

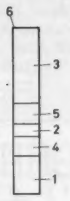
**Joachim Alberty, Helsinki; Eero Salomaa, Kauklahti; Nils-Erik Saris, Helsinki; Eero Sjöström, Kauniainen, and Gabriel Zewi, Tapiola, all of Finland, assignors to Orion-Yhtymä OY, Helsinki, Finland**

**Filed Jan. 31, 1973, Ser. No. 328,336**
**Claims priority, application Finland, Feb. 2, 1972, 319/72**
**Int. Cl. G01n** *21/06, 33/16*
**U.S. Cl. 23—253 TP** **3 Claims**

1. A test strip for the detection of barbituric acid, barbituric acid derivatives and glutethimide in biological fluids comprising a bibulous paper strip having consecutive chemically-impregnated zones sequentially identified from one end of said strip as follows:

a. a first zone impregnated with an acid for acidifying a

sample of the biological fluid being tested,
b. a second zone impregnated with alkaline buffered mercuric acetate, and
c. a third zone impregnated with diphenyl carbazone.

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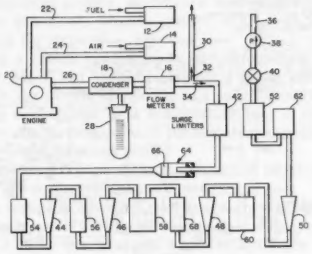
**3,895,915**
**GAS ANALYZING**
**Charles W. Haldeman, Concord, Mass., assignor to Megatech Corporation, Billerica, Mass.**
**Filed Aug. 16, 1973, Ser. No. 389,015**
**Int. Cl. G01n** *31/06, 33/22*
**U.S. Cl. 23—254 R** **8 Claims**




1. Gas analyzing apparatus comprising,
means defining a gas flow series array of flowmeters between a gas flow inlet and a gas flow outlet interspersed with means for selectively sorbing component gases of a gas mixture to be analyzed,
means defining a gas sampling system connected to said gas flow inlet for taking gas samples and comprising means for condensing water vapor and for dumping a portion of the gas sampled before admittance of the balance to said gas flow inlet,
means for driving gas through said array and selecting flow rate therefor and proportions of sample gas dumped and sampled gas admitted to said gas flow inlet,
and means for displaying directly differential flow rate between at least two of said flowmeters indicative of gas sorbed in the course of passage of a sample gas mixture between said flowmeters, and wherein
said two flowmeters are of ball and tube type and are arranged with their tubes in parallel and said display means comprise a common scale between said tubes,
and further comprising an additional flowmeter means located within said apparatus for defining a zero reference for said scale.

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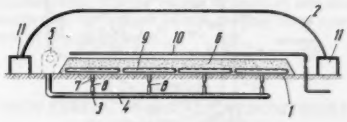
**3,895,916**
**COMPOSTING INSTALLATION**
**Kurt Rosner, Munster, Germany, assignor to Hazemag Dr. E. Andreas KG, Munster, Germany**
**Filed May 31, 1973, Ser. No. 365,763**
**Claims priority, application Germany, June 2, 1972, 2226729**
**Int. Cl.² C05F** *9/00, 9/02;* **E04B** *1/345*
**U.S. Cl. 23—259.1** **14 Claims**




1. In a composting installation, a combination comprising support means for material to be composted; an inflatable bubble covering said support means and having an air lock for ingress and egress of the material; supply means for continuously supplying pressurized air into the interior of said bubble; vent means communicating said interior of said bubble with the exterior thereof; means for controlling at least one of said supply means and vent means so as to establish a controlled air flow and an overpressure in said interior for maintaining said bubble inflated; and means for directing said pressurized air through said composting material and said support means so as to enhance the composting process in said composting material.

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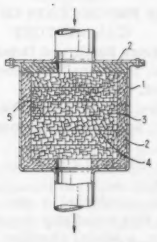
**3,895,917**
**GAS REACTORS INCLUDING FOAM-STRUCTURED CERAMIC BODY WITH INTEGRAL INTERNAL CERAMIC BAFFLES**
**Frank Ernest George Ravault, Birmingham, England, assignor to Foseco International Limited, Birmingham, England**
**Filed Dec. 29, 1972, Ser. No. 319,847**
**Claims priority, application United Kingdom, Jan. 14, 1972, 1932/72**
**Int. Cl.² B01J** *8/00;* **F01N** *3/10, 3/15*
**U.S. Cl. 23—277 C** **5 Claims**

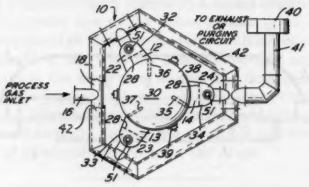



1. A reactor element comprising a body of porous foam-structured ceramic material made by impregnating an organic foam with a slurry of ceramic material, drying and firing the foam, and having integral therewith a plurality of internal impermeable baffles defining a tortuous path through the element and formed by locating in the so impregnated foamed body, prior to firing, layers of porous sheet material impregnated with ceramic slurry at the positions where it is desired to have the baffles in the finished element.

## 3,895,918
## HIGH EFFICIENCY, THERMAL REGENERATION ANTI-OLLUTION SYSTEM

James H. Mueller, 100 E. Hunter Ave., Maywood, N.J. 07607

Filed Jan. 16, 1973, Ser. No. 324,230
Int. Cl. F23g 7/06; F23c 9/04
U.S. Cl. 23—277 C 11 Claims




1. Apparatus for processing of an industrial exhaust gas flow or the like comprising:

a. a centrally disposed chamber in which a high temperature range is maintained,

b. at least three separate, spaced heat-exchange beds disposed substantially equiangularly around and protruding from the periphery of said chamber, each bed containing randomly disposed packing comprised of a plurality of solid heat exchange elements, said beds being bounded by vertical non-parallel walls,

c. a plurality of inlet means, each being coupled to one of said beds, for conducting said gas flow to said bed for passage through it into said chamber,

d. a plurality of outlet means, each coupled to one of said beds, for conducting said gas flow away from said bed after the gas flow has passed outwardly through said bed from said central chamber, and

e. fueled heating means within said chamber for continuously producing or maintaining said high temperature range, said temperature range being considerably higher than the temperature range of the gas flow as it first is applied to the apparatus and sufficiently high to cause continuous thermal oxidation of said gas flow.

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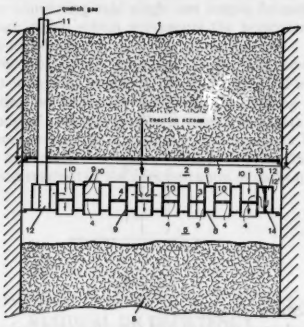
## 3,895,919
## DEVICE FOR THE PRODUCTION OF A HOMOGENOUS GAS MIXTURE

Friedrich Forster; Erich Barth, and Heinz-Jochen Keller, all of Dortmund-Horde, Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Filed Nov. 29, 1973, Ser. No. 419,909
Claims priority, application Germany, Jan. 13, 1973, 2301644
Int. Cl. B01j 4/00, 7/02, 9/00
U.S. Cl. 23—288 K 1 Claim

1. Apparatus for producing a gas mixture, comprising means providing a free equalizing space beneath a superimposed catalyst layer, a mixing chamber in said space having spaced upper and lower plates, a plurality of spaced open ended mixing tubes having their upper and lower end portions sealed in said plates, within each tube a partition between the upper and lower ends thereof, said partition having a restricted orifice, a quench gas pipe leading to said mixing chamber and terminating in a duct means positioned between said upper and lower plates, said duct means having an outer wall and an inner wall, the outer wall of said duct means constituting the periphery of said mixing chamber, and the inner wall of said duct means extending from the upper to the lower plate of said mixing chamber and being displaced inwardly of said periphery, the duct consequently surrounding said plurality of mixing tubes, a plurality of openings in the inner wall of said duct means at points below said partitions to permit passage of quench gas about said mixing tubes, and




orifices in said mixing tubes above said partitions to admit quench gas thereto.

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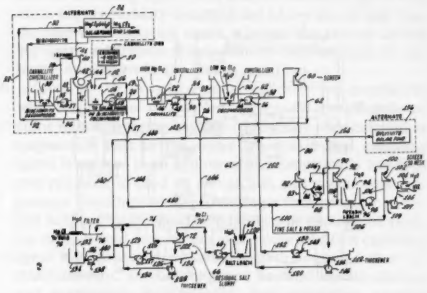
## 3,895,920
## METHOD OF PRODUCING COARSE POTASH

Donald E. Garrett, 505 W. Ninth St., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 69,219, Sept. 3, 1970, abandoned. This application Sept. 17, 1973, Ser. No. 397,963
Int. Cl. B01d 9/00; C07d 3/00; C13k 1/10; C09d 1/30
U.S. Cl. 23—298 7 Claims



1. A method for producing coarse crystals of KCl from the direct decomposition of carnallite, comprising:

a. crushing an ore containing substantial quantities of carnallite;

b. mixing said crushed ore in an aqueous liquor having a $MgCl_2$ content of at least about 68 mols per 1,000 mols of water to form a slurry whereby decomposition of said carnallite is substantially prevented;

c. passing said slurry into a crystallizer into which an aqueous decomposition liquor having an $MgCl_2$ content up to about 65 mols per 1,000 mols of water is continuously added;

d. intensely re-circulating within the crystallizer the thus formed mixture of the slurry and the decompositon liquor such that the amount of liquor which is being re-circulated is substantially greater than the amount of new decomposition liquor which is added, whereby the driving force towards decomposing the carnallite and the crystallization of KCl is substantially lessened;

e. introducing and maintaining in said crystallizer between about 10 wt. % and about 40 wt. % of KCl seed, said wt. % being based on the weight of solids in said slurry;

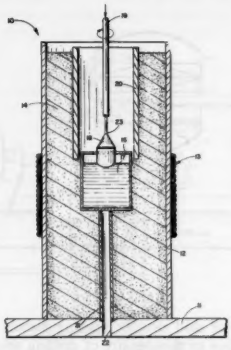
f. continuously forming KCl crystals in said crystallizer and elutriating therefrom KCl crystals of a size -80 mesh thereby to promote formation of about +50 mesh KCl crystals;

g. recovering said +50 mesh KCl crystals.

## 3,895,921
## GROWTH OF INCONGRUENTLY MELTING CRYSTALS FROM A QUATERNARY SILICATE SYSTEM USING THE CZOCHRALSKI METHOD

Michael F. Ehman, Mission Viejo, and Stanley B. Austerman, Villa Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 19, 1973, Ser. No. 426,412
Int. Cl. B01j *17/00, 17/20*
U.S. Cl. 23—301 SP 6 Claims



1. A method of growing single crystal compounds from the class comprising mullite, akermanite and gehlenite selected from the quaternary silicate system $Al_2O_3$-CaO-MgO-$SiO_2$, comprising the steps of:

forming a charge containing weight percentages of $Al_2O_3$, CaO, MgO, and $SiO_2$ corresponding to the weights present in the silicate compound in a suitable reservoir;

heating said charge to a temperature that is sufficiently above the melting point of the silicate compound to provide a homogeneous melt;

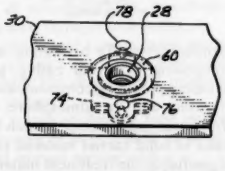
placing a seed crystal of the compound in physical contact with the surface of the melt; and

pulling vertically upward a seed crystal from the melt at (a) predetermined withdrawal rate on the order of about 0.2 to 0.3 inches per hour and a rotational rate on the order of about 14 to 30 rpm.

## 3,895,922
## RING PAD STRESS COINED STRUCTURE

Austin Phillips, Santa Monica, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Division of Ser. No. 277,359, Aug. 2, 1972, Pat. No. 3,796,086. This application Nov. 12, 1973, Ser. No. 415,174
Int. Cl. B26f *1/00*
U.S. Cl. 29—183 3 Claims




1. A structural member having a first and second surface and a discontinuity in at least the first surface, the improvement comprising:

a first depressed groove coldworked in said first surface spaced from said discontinuity, said depressed groove having a cross section which has a linear portion at the bottom thereof and a grooved portion which extends upwardly from a point of tangency with said linear portion to said first surface, said coldworked depressed groove forming a first volume of member material having residual radial and circumferential compressive stress therein due to said coldworking thereof, said first volume being adjacent said discontinuity and extending therefrom to said first groove and a second volume of member material between said first and second surfaces and under said first groove, said first and second volumes of stressed material improving the fatigue strength of said structural member by fencing out fatigue causing stress concentrations at the discontinuity.

## 3,895,923
## HIGH STRENGTH METAL CARBONITRIDED COMPOSITE ARTICLE

Gene F. Wakefield, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1969, Ser. No. 889,347
Int. Cl. B32b *15/02, 15/08*
U.S. Cl. 29—191 8 Claims

1. A laminated composite article comprising a first layer of a solid solution carbonitride of a metal selected from silicon, boron, and the transition metals in Groups IVB, VB and VIB of the Periodic Table integrally bonded between second and third metal layers.

## 3,895,924
## CONSUMABLE WELD INSERT

Emerson J. Hallenbeck, 2934 Shoreland Ave., Toledo, Ohio 43611

Division of Ser. No. 171,546, Aug. 13, 1971, Pat. No. 3,770,302. This application Feb. 7, 1973, Ser. No. 330,203
Int. Cl. B22f *5/00*
U.S. Cl. 29—183 6 Claims

1. A consumable weld insert made of weld metal for connecting adjacent ends of two sections of pipe or the like, said insert comprising a ring-like body of weld metal, said ring having an internal diameter and an external diameter, with an inner edge portion adjacent the inner diameter and an outer edge portion adjacent the outer diameter, said body having a wedge-shaped, transverse cross section with the inner edge portion being thicker than the outer edge portion.

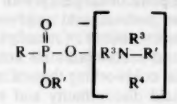
## 3,895,925
## MOTOR FUEL COMPOSITION

Raymond C. Schlicht, Fishkill, and George W. Eckert, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 10, 1974, Ser. No. 477,716
Int. Cl. C10l *1/26*
U.S. Cl. 44—72 11 Claims

1. A motor fuel composition comprising a mixture of of hydrocarbons in the gasoline boiling range containing from

about 0.0005 to 0.1 wt. percent of an alkylammonium alkyl alkanephosphonate represented by the formula;



in which R is an aliphatic hydrocarbon radical having from about 8 to 22 carbon atoms, R′ is a lower aliphatic hydrocarbon radical having from 1 to 2 carbon atoms. $R^2$ is an aliphatic hydrocarbon radical having from 8 to 20 carbon atoms or an aminoalkyl group of the structure $NH_2(CH_2)_n$- or an N′ - alkylaminoalkyl group of the structure $R^5$-NH-$(CH_2)_n$-, where $R^5$ is an aliphatic hydrocarbon radical having from 8 to 20 carbon atoms and n is an integer from 2 to 6, and $R^3$ and $R^4$ each represent a hydrogen atom or an alphatic hydrocarbon radical having from 1 to 20 carbon atoms.

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**3,895,926**

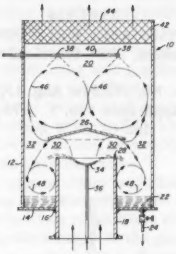
## METHOD FOR TREATING A GAS

**Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238**

**Continuation-in-part of Ser. No. 356,572, May 2, 1973, abandoned. This application Apr. 9, 1974, Ser. No. 459,290**

**Int. Cl.² B01D** *47/06;* **B05B** *7/10*

**U.S. Cl. 55—84** **10 Claims**



1. A method for treating a gas with apparatus including a treating vessel, a liquid spray nozzle, and means for supplying a liquid to said nozzle, the said method comprising,

introducing a stream of untreated gas into said vessel,

forming at least one toroidal vortex of said untreated gas in said vessel, the axis of said vortex being generally transverse to the flow of said untreated gas,

introducing said liquid in droplet form into said vortex by means of said nozzle, the liquid injection rate of the liquid droplets and the liquid pressure of said nozzle respectively being sufficient to cause a trapped-spray zone of extremely high liquid holdup in said vortex, and

withdrawing said treated gas from said vessel.

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**3,895,927**

## APPARATUS FOR THE DEGASSIFICATION OF DRILLING MUDS

**Gerald E. Bournham, Sr., Lafayette, La., assignor to Well Control, Inc., Houston, Tex.**

**Continuation of Ser. No. 119,799, March 2, 1971, abandoned, which is a division of Ser. No. 12,543, Feb. 19, 1970, Pat. No. 3,616,599. This application May 14, 1973, Ser. No. 359,625**

**Int. Cl.² B01D** *19/00*

**U.S. Cl. 55—170** **11 Claims**

1. A system for degassification of drilling mud comprising a vacuum tank defining a degassification area in the upper portion and a mud receiving area in the lower portion,

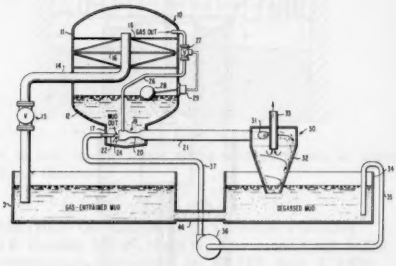
means in communication with said degassification area for drawing a vacuum on said tank to effect a separation of entrapped gas from said mud,

a mud outlet conduit in communication with said mud receiving area,

a mud inlet conduit in communication with said degassification area, and

density sensing means for controlling mud flow into said tank,

a portion of said density sensing means providing means to throttle said mud inlet conduit to vary the rate of mud flow therethrough,



a portion of said density sensing means providing means responsive to the density of drilling mud,

said means responsive to the density of drilling mud being responsive to the density of that certain mud which is in said mud inlet conduit,

said means responsive to the density of drilling mud being associated with said means to throttle the inlet conduit so as to throttle the inlet conduit to decrease the flow therethrough upon a decrease in the density of said mud in said mud inlet conduit and to allow increased flow through said mud inlet conduit upon an increase in the density of said mud in said mud inlet conduit.

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**3,895,928**

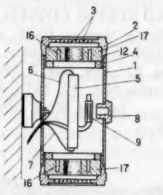
## AIR TREATMENT DEVICE

**Gonzalo Moran, Madrid, Spain, assignor to Comercial Super - Dix, S.A., Madrid, Spain**

**Filed Sept. 26, 1972, Ser. No. 292,308**

**Int. Cl.² A61L** *9/02*

**U.S. Cl. 21—74 R** **5 Claims**



1. An air treatment device for perfuming, deodorizing and purifying air comprising, a tubular casing, grate means on each end of said casing providing communication between the interior of said casing and the atmosphere, holding means axially spaced from said grate means at each said one end of said casing, a cake of solid carrier material carrying thereon a heat activated gasifiable, air-treatment material mounted on each said holding means adjacent its respective grate means, an electrically activated heating means in said casing between said two cakes of carrier material to heat said cakes of carrier material and liberate the treatment material therein which passes through the respective grate means to the area adjacent

the casing, and means for connecting said heating means to an electrical power source.

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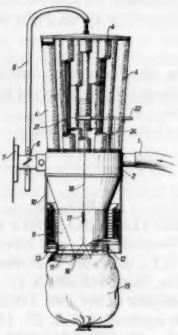
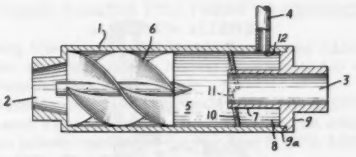
3,895,929
DEVICE FOR COLLECTING DRILL DUST
Goran Jysky; Ilmar Mardla, and Bjorn Eriksson, all of Nykoping, Sweden, assignors to Ilmeg AB, Nykoping, Sweden
Filed July 17, 1972, Ser. No. 272,415
Claims priority, application Sweden, July 19, 1971, 9269/71
Int. Cl. B01d 50/00
U.S. Cl. 55—334 3 Claims



1. A device for collecting drill dust, especially in rock drilling, comprising:
means for conveying dust in an air stream;
means for separating the dust from said air stream, said separating means having a downwardly opening dust outlet;
means for storing a stock of flexible tube material in annular folded form around the lower portion of said separating means and the dust outlet thereof, said storing means being equipped with means for dispensing said tube material from storage intermittently in desired lengths to allow formation of successive bags therefrom in position for filling with dust through said outlet;
means surrounding said tube material stored in said storing means for causing a bag formed as aforesaid to be secured tightly around the downwardly opening outlet of said separating means;
a continuous length of flexible tube material sufficient to form a plurality of bags folded in an annular pack and held in said storage means, and
means for temporarily closing said dust outlet in the interval between the filling of one bag and completion of the formation and securing of a succeeding bag without interrupting the operation of said separating means or that of said conveying means.

3,895,930
VORTEX SEPARATOR
Joseph Campolong, St. Petersburg, Fla., assignor to Pall Corporation, Glen Cove, N.Y.
Continuation-in-part of Ser. No. 306,119, Nov. 13, 1972, abandoned, which is a continuation of Ser. No. 31,471, April 24, 1970, abandoned. This application May 15, 1973, Ser. No. 360,516
Int. Cl. B01d 45/16
U.S. Cl. 55—394 10 Claims



1. A vortex particle separator with provision to prevent abrasion by separated particles retained therein, and/or exhausted therefrom by scavenge flow, comprising a tubular body having an inlet at one end, an outlet at the opposite end and a central passage therebetween; a deflector coaxially mounted in the passage adjacent the inlet, having a plurality of helical vanes abutting the wall of the passage, and positioned at an angle to the line of flow from the inlet to the outlet so as to create a vortex stream in the influent air, which concentrates the contaminant particles in the whirling stream at the periphery of the passage, thereby leaving the air at the center of the passage relatively clean; a generally tubular outlet member disposed within the central passage at the outlet end of the tubular body, for delivery of clean air from the central passage of the tubular body; said tubular outlet member defining an annular contaminant chamber between the exterior of the outlet member and the interior wall of the central passage of the tubular body receiving separated contaminant particles; an outlet port in a wall of the annular contaminant chamber for scavenge flow; a wall extending between the tubular outlet member and the tubular body at the outlet end of the annular chamber closing off the annular chamber at that end; and a baffle having at least one opening defining an inlet into the annular chamber and disposed across the entrance to the annular chamber so that the annular chamber is closed off at that end, and all flow of air and separated particles that enter the annular chamber must pass through the opening, the baffle being effective at least when scavenge flow ceases, and optionally, also while scavenge flow continues, to deflect the whirling air stream in a manner to inhibit the whirling movement of the particles retained in the chamber, and thus prevent abrasion of the wall of the tubular body there, substantially without interfering with the entry of particles into the chamber or with normal scavenge flow, the opening having a larger available open area than the outlet port from the annular chamber, so that at least some particles small enough to enter the annular chamber via the opening cannot escape from the annular chamber.

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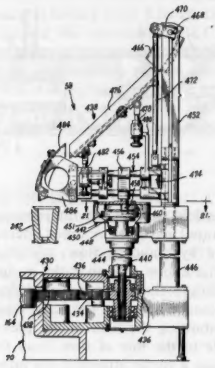
3,895,931
CONTINUOUS MOTION GLASS MOLDING MACHINE WITH GOB DELIVERY MEANS
Joseph R. Hamilton, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.
Filed Oct. 5, 1972, Ser. No. 295,164
Int. Cl. C03b 5/30
U.S. Cl. 65—207 20 Claims

1. In a continuous motion glass molding machine: upwardly opening mold means; means for delivering a glass gob into said mold means; means for pivoting said delivering means about an upright axis; said delivering means having a delivery

end for the gob at a fixed horizontal distance from the upright axis; drive means for pivoting said delivering means with said delivery end through an arcuate path of travel of fixed length within a first horizontal plane; a base; carriage means on said base for carrying said mold means; mold drive means for continuously moving said carriage means and mold means thereon in synchronization with said delivery end of said



delivery means; fixed cam means on said base; means interconnecting said cam means and said carriage means for moving said mold means into the fixed length path of said delivery end when aligned below said path of travel of said delivery end; and means to supply a glass gob to said delivery means including said delivery end whereby said mold means is moving in the same arcuate path of travel in the same direction as said delivery end during the same period.

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**3,895,932**

## METHOD OF INHIBITING ALGAE EMPLOYING NITROGEN DERIVATIVES OF HALOGENATED BIPHENYLS

**John J. Merianos, Jersey City, N.J.; Edward Griffin Shay, Suffern, N.Y.; Phillip Adams, Murray Hill, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 38,513, May 18, 1970, Pat. No. 3,733,421, which is a continuation-in-part of Ser. No. 883,636, Dec. 9, 1969, Pat. No. 3,663,620. This application Apr. 9, 1973, Ser. No. 349,630**

**Int. Cl.[2] A01N** *9/20*

**U.S. Cl. 71—67** **3 Claims**

1. A method of inhibiting algae which comprises applying to the algae an algaecidally effective amount of at least one disubstituted polyhalobiphenyl selected from the group consisting of:

Bis-(Ethylenediamino) Trichlorobiphenyl
Bis-(Propylenediamino) Trichlorobiphenyl
Bis-(3-Dimethylaminopropylamino) Trichlorobiphenyl
Bis-(Triethylenetetramino) Trichlorobiphenyl
Bis-(isophoronediamino) Trichlorobiphenyl
Bis-(Hexamethylenediamino) Trichlorobiphenyl
Bis-(Diethylenetriamino) Octachlorobiphenyl
Bis-(isophoronediamino) Tetrachlorobiphenyl
Bis-(isophoromediamino) Octachlorobiphenyl
Bis-(Ethylenediamino) Tetrachlorobiphenyl

**3,895,933**

## PLANT GROWTH REGULANTS COMPRISING 2-HYDROXYETHYL-1-PYRIDINIUM-(1) SALTS

**Gerhard Jäger, Wuppertal, and Klaus Lürssen, Grosskoenigsdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

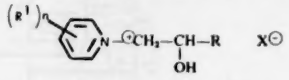
**Filed June 14, 1973, Ser. No. 370,067**

**Claims priority, application Germany, June 21, 1972, 2230179**

**Int. Cl. A01n** *9/22*

**U.S. Cl. 71—94** **7 Claims**

1. Method of influencing the growth of plants which method comprises applying thereto a regulatingly effective amount of a composition containing as an active ingredient a 2-hydroxyethyl-1-pyridinium-(1) salt of the formula



wherein

R is phenyl; substituted phenyl wherein the substituent is at least one of halogen, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, nitro and hydroxyl; furyl; or thienyl;

*n* is 1, 2 or 3;

$R^1$ is hydrogen, alkyl of up to 6 carbon atoms or halogen; the $R^1$ substituents being selected independently when *n* is 2 or 3; and

$X^-$ is a halide or perchlorate ion;

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**3,895,934**

## DINITROPHENYLENEDIAMINES AS HERBICIDES

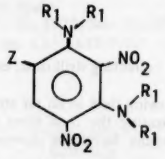
**Jerome Linder, Westfield, N.J., and Edward D. Weil, Hastings-on-Hudson, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.**

**Continuation-in-part of Ser. No. 577,154, Sept. 6, 1966, abandoned. This application Feb. 27, 1970, Ser. No. 15,301**

**Int. Cl. A01n** *9/20*

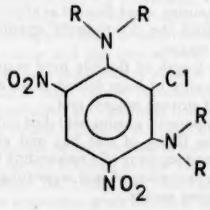
**U.S. Cl. 71—121** **4 Claims**

1. A method for controlling weeds comprising applying, to the locus to be controlled, a herbicidal amount of a compound of the formula



in which Z is lower alkyl, each $R_1$ is selected from the group consisting of hydrogen and lower alkyl.

4. A method for controlling weeds comprising applying, to the locus to be controlled, a herbicidal amount of a compound of the formula



in which each R is selected from the group consisting of hydrogen and lower alkyl, at least one of said R's being a lower alkyl.

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3,895,935

## PROCESS FOR ELECTROSLAG REFINING OF URANIUM AND URANIUM ALLOYS

Philip S. Lewis, Jr., Oak Ridge; William A. Agee, Jacksboro; Jonathan S. Bullock, IV, and James B. Condon, both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 16, 1974, Ser. No. 533,111

Int. Cl.[2] C22B *4/00*

U.S. Cl. 75—10 R 5 Claims

1. An improvement in the method of salvaging and refining scrap oxidized uranium material by electroslag melting comprising the steps of forming the scrap uranium material into an elongated electrode, electrically melting uranium material in a crucible within a closed furnace having an atmosphere of inert gas maintained at a subatmospheric pressure for forming a pool of molten uranium material, introducing a granular slag of a fluoride material into said furnace atop said pool of molten uranium material, melting the slag to form a molten body of slag above said pool, electrically melting said electrode within said molten body of slag to form droplets of molten uranium material which pass through said molten body of slag into said pool for forming an ingot of said uranium material, and thereafter separating said ingot from said slag; said improvement being in the step of reducing the oxygen content in the uranium material forming said ingot to a level of less than 100 ppm by incorporating calcium metal in said slag in an amount effective to reduce the oxides in said electrode to said level in said ingot.

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3,895,936

## PROCESS FOR REDUCING IRON OXIDES IN ROTARY KILN

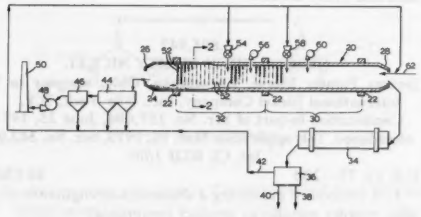
Hans D. Toepell, 4 Erinbrook Ct., Islington, Ontario, Canada

Filed Oct. 18, 1973, Ser. No. 407,592

Claims priority, application United Kingdom, Oct. 20, 1972, 48381/72

Int. Cl.[2] C21B *13/08*

U.S. Cl. 75—29 3 Claims



1. In a process for reducing iron oxide bearing materials of a type comprising the steps: mixing said materials with reducing agent having volatiles to prepare a kiln charge; entering the kiln charge into a charge end of a kiln; causing combustion to reduce the iron oxide; and allowing the products of combustion to exit through the charge end of the kiln, the improvement in which the kiln is provided with a heat transfer zone and a reduction zone, and in which oxygen is fed into the kiln adjacent an interface between the reduction zone and the heat transfer zone to support the last of the combustion in the reduction zone, the oxygen supply being adjustably controlled to effectively confine combustion to the reduction zone so that the products of combustion passing through the heat transfer zone have substantially no oxygen thereby preventing combustion in the heat transfer zone, and in which the heat transfer zone is provided with heat transfer elements to enhance heat transfer from the products of combustion to the charge for driving off volatiles and moisture from the charge before reduction.

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3,895,937

## DYNAMIC VACUUM TREATMENT TO PRODUCE ALUMINUM ALLOYS

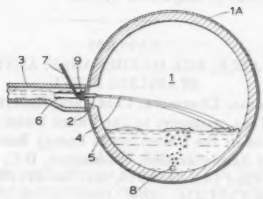
Ole Georg Gjosteen; Trygve Olavson Terum, and Aksel Ola Aarflot, all of Sunndalsora, Norway, assignors to A/S Ardal OG Sunndal Verk, Oslo, Norway

Continuation-in-part of Ser. No. 269,086, July 5, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,859

Claims priority, application Norway, May 5, 1972, 1607/72; July 16, 1971, 2730/71

Int. Cl. C22c *1/02*

U.S. Cl. 75—68 R 8 Claims



1. A method for producing aluminum alloys by means of a melting and mixing process, said method comprising:

introducing desired alloying elements into a vacuum furnace;

substantially reducing the pressure in said vacuum furnace, thus creating a vacuum therein;

thereafter introducing by suction into said vacuum furnace aluminum melt, having undesirable impurities therein, in the form of a free-falling metal jet and passing said free-falling metal jet without obstruction through the interior of said vacuum furnace to form in said vacuum furnace a melt bath formed by said aluminum melt and said alloying elements, reducing the content of said impurities in said free-falling metal jet, and thereafter directing said free-falling metal jet against said melt bath, thereby dissolving and mixing said alloying elements into said aluminum melt.

3,895,938

## PURIFICATION OF MERCURY

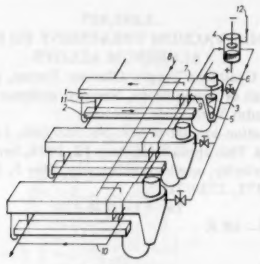
Helmut Klotz, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 14, 1974, Ser. No. 433,324

Claims priority, application Germany, Jan. 27, 1973, 2304063

Int. Cl. C22b *43/00*

U.S. Cl. 75—101 R 6 Claims



1. In the purification of mercury by contacting it with an aqueous medium to extract the impurities into the aqueous medium the improvement which comprises employing as said aqueous medium a solution of sulfuric acid having mercury (I) sulfate dissolved or suspended therein.

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3,895,939

## WELDABLE, AGE HARDENABLE, AUSTENITIC STAINLESS STEEL

John A. Brooks, Livermore, Calif., and Robert W. Krenzer, Arvada, Colo., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 31, 1973, Ser. No. 411,554

Int. Cl.[2] C22C *38/06, 38/44, 38/46, 38/50*

U.S. Cl. 75—124 6 Claims

1. A stainless steel for use in hydrogen environment with good retention of properties having high weldability and minimum susceptibility to hot cracking during welding consisting of from about 0 to about 0.0015 weight percent boron, from about 0 to about 0.25 weight percent silicon, from about 0 to about 0.25 weight percent manganese, from about 0.01 to about 0.05 weight percent carbon, and the remainder consisting of from about 24.0 to about 34.0 weight percent nickel, from about 13.5 to about 16.0 weight percent chromium, from about 1.9 to about 2.3 weight percent titanium, from about 1.0 to about 1.5 weight percent molybdenum, from about 0 to about 0.01 weight percent phosphorous, from about 0 to about 0.010 weight percent sulfur, from about 0.1 to about 0.35 weight percent aluminum, from about 0.10 to about 0.50 weight percent vanadium, and the balance iron.

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EAS JG

3,895,940

## CORROSION RESISTANT HIGH CHROMIUM FERRITIC STAINLESS STEEL

Clarence George Bieber, West Milford, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 841,121, July 11, 1969, abandoned. This application Dec. 23, 1971, Ser. No. 211,736

Int. Cl. C22c *39/20*

U.S. Cl. 75—128 W 25 Claims

1. A stainless steel having a substantially ferritic microstructure and characterized by good resistance to corrosive environments such as stagnant seawater while concomitantly displaying good notch toughness, said steel consisting essentially of from 30 to about 36% chromium, from 0.5 up to about 5% molybdenum, up to 3% silicon, with the provisos that the "CMS" indicator represented by the sum of the chromium plus three times the amount of molybdenum plus three times the percentage of silicon is not less than 34%, nor above about 48% where good workability is desired, about 2 to about 8% nickel, up to less than 2% titanium, up to about 2% vanadium and up to about 2% columbium, with at least one element from the group consisting of titanium, vanadium and columbium being present in a small but effective amount to enhance the corrosion resistance in respect of steels produced by air melting and in which the "CMS" indicator is not above about 41%, the sum total of titanium, vanadium and columbium not exceeding about 4%, up to 0.1% carbon, up to 2% aluminum, up to about 2% manganese, up to about 10% cobalt, up to about 4% tungsten, and the balance essentially iron.

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3,895,941

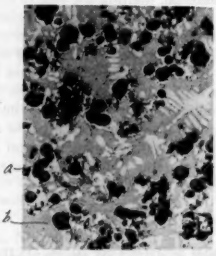
## ALUMINUM SILICON ALLOYS

Gustaf Frederic Bolling, Dearborn, Mich., and Jean Cisse, St. Germain en Laye, France, assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 1, 1973, Ser. No. 402,527

Int. Cl.[2] C22C *21/04*

U.S. Cl. 75—148 8 Claims



7. A hypereutectic aluminum-silicon alloy composition consisting essentially of 16–18% silicon, $Al_2O_3$ in an amount such that the sum of silicon plus $Al_2O_3$ is generally about 20% by volume of the alloy, sodium being present in an effective amount less than 1.5% to refine the eutectic silicon, remainder aluminum, said composition being characterized by both the eutectic silicon and primary silicon being uniformly distributed and finely divided.

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3,895,942

## STRONG, HIGH PURITY NICKEL

Jeremy Painter Morse, Chesapeake, Ohio, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 157,004, June 25, 1971, abandoned. This application Mar. 16, 1973, Ser. No. 342,034

Int. Cl. B22f *1/00*

U.S. Cl. 75—200 14 Claims

1. A method of producing a dispersion-strengthened nickel alloy powder metallurgy product comprising:

a. providing a blended powder charge consisting essentially of, by weight, up to about 0.2 percent carbon, about 0.07 to about 0.1 percent magnesium; a metal oxide as a source of oxygen, said metal oxide being present in sufficient amount to oxidize at least 10 percent of the magnesium to magnesia, said metal oxide being stable at the temperature at which the magnesium vaporizes, and said metal oxide having a free energy of formation less than that of the magnesia; and the balance fine nickel powder;

b. sintering the powder mixture in a reducing atmosphere at a temperature at least in excess of the boiling point of magnesium in said charge to convert metal in said metal oxide to the elemental state and magnesium to magnesia and to form a sintered billet; and

c. thereafter hot working the sintered billet to provide a dispersion-strengthened product.

3,895,943

## METHOD FOR THE PREPARATION OF CDS OR CDSE POWDER FOR ELECTROPHOTOGRAPHY

**Hiroshi Hanada, Yokohama, and Nobuo Kitajima, Tokyo, both of Japan, assignors to Canon Camera Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 164,464, July 20, 1971, abandoned, which is a division of Ser. No. 734,637, June 5, 1968, abandoned. This application July 30, 1973, Ser. No. 383,610**

**Int. Cl.[2] G03G** *5/04*

**U.S. Cl. 96—1.5** **2 Claims**

1. A process for preparing CdS or CdSe powder useful as an electrophotographic material in an electrophotographic process which method consists of: (1) activating the Cds or CdSe powder by adding thereto silver or copper as an activator as a silver or copper compound and firing the resulting mixture in the presence of hydrochloric acid and at least one member selected from the group consisting of cadmium chloride and zinc oxide; (2) washing the powder produced by step (1) with water; (3) drying the water-washed powder; and (4) firing the dried powder in an atmosphere of sulfur vapor.

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3,895,944

## ELECTROPHOTOGRAPHIC RECORDING MATERIAL HAVING A LAYERED STRUCTURE OF CHARGE GENERATING AND CHARGE TRANSPORT LAYERS

**Wolfgang Wiedemann, Geisenheim-Johannisberg, and Horst Zimmer, Niedernhausen, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany**

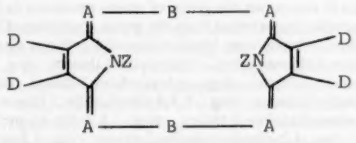
**Filed Apr. 25, 1973, Ser. No. 354,202**

**Claims priority, application Germany, Aug. 14, 1972, 2239924**

**Int. Cl. G03g** *5/04*

**U.S. Cl. 96—1.5** **14 Claims**

1. Electrophotographic recording material comprising an electroconductive support and a photoconductive double layer of organic materials thereon, said double layer being composed of a homogeneous, opaque, charge carrier producing dyestuff layer of a dyestuff corresponding to the general formula



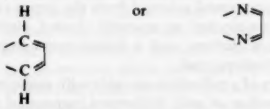
wherein

Z is hydrogen or two groups Z together stand for a bivalent metal atom,

A is nitrogen or CR, with R being hydrogen, alkyl with 1 to 4 carbon atoms, phenyl, which may be substituted by alkyl with 1 to 4 carbon atoms or halogen, and

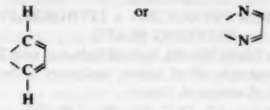
B is an m-phenylene, 2,6-pyridylene, 1,3-isoindolylene or pyrrolylene group, and

D is hydrogen, or two groups D together stand for a group

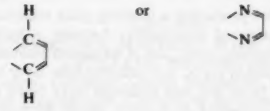


with the proviso that

1. if B is m-phenylene or 2,6-pyridylene, A is nitrogen and two groups D together stand for a group



2. if B is 1,3-isoindolylene, A is nitrogen and two groups D together stand for a group



and

3. if B is pyrrolylene, A is CR and D is hydrogen, and a transparent top layer of insulating materials containing at least one charge transporting compound, in which the transparent top layer is composed of a mixture of a binder with a charge-transporting, monomeric heterocyclic compound having an extended $\pi$-electron system which is substituted by at least one dialkylamino group or by two alkoxy groups, or with a condensation product of 3-bromopyrene and formaldehyde.

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3,895,945

## PROCESS FOR PREPARATION OF A DYESTUFF SENSITIZED PHOTOCONDUCTIVE COMPOSITION

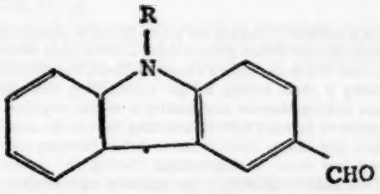
**Syu Watarai, and Yoshio Seoka, both of Tokyo, Japan, assignors to Rank Xerox, Ltd., London, England**

**Filed Nov. 14, 1973, Ser. No. 415,594**

**Int. Cl. G03g** *5/06;* **G03c** *1/72*

**U.S. Cl. 96—1.6** **11 Claims**

1. A process for preparation of a dyestuff sensitized photoconductive composition from an organic polymeric photoconductive material, polyphosphoric acid and a compound of the formula



wherein R is alkyl of 1 to 5 carbon atoms, said process comprising:

a. providing a mixture containing (i) organic polymeric photoconductive material (ii) about 2 to about 50 parts by weight of a compound of the above formula per 100 parts organic polymeric photoconductive material, and (iii) a quantity of polyphosphoric acid equivalent to about 5 to about 50 times the weight of organic polymeric photoconductive material in the mixture; and

b. heating said mixture at a temperature in the range of from about 20° to about 120°C for an interval sufficient to effect condensation polymerization of the compound of the above formula to the extent desired.

## 3,895,946
## PROCESS FOR PRODUCING A LITHOGRAPHIC PRINTING PLATE

**Kikuo Kubotera; Eiichi Mizuki, both of Saitama, and Tadahiro Fujiwara, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

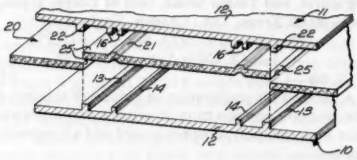
**Filed Oct. 18, 1972, Ser. No. 298,695**
**Claims priority, application Japan, Oct. 18, 1971, 46-82345; Oct. 18, 1971, 46-82346**
**Int. Cl. G03f 7/02**
**U.S. Cl. 96—33** **5 Claims**

1. A process for producing a printing plate material which comprises the steps of successively forming a hydrophilic layer, an intermediate layer, and a hardened photosensitive silver halide emulsion layer, said intermediate layer between said hydrophilic layer and said emulsion layer being etching-bleachable corresponding to a silver image formed in said emulsion layer and said intermediate layer enabling easy removal of said emulsion layer, on a support having a hydrophobic surface to obtain a photosensitive printing plate material, the hydrophilic layer being etching-bleachable corresponding to a silver image formed in the emulsion layer, exposing the emulsion layer through a negative copy, developing to form a silver image in said emulsion layer, removing portions of said hydrophilic layer corresponding to said silver image in the emulsion layer by an etching-bleaching treatment to thereby expose the corresponding portions of said support material, and removing the entire emulsion layer and intermediate layer in the non-image areas to thereby expose the hydrophilic layer.

## 3,895,947
## METHOD OF MAKING DIE PLATES

**Albert J. Sarka, Fairview Park, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 159,961, July 6, 1971, abandoned. This application Jan. 9, 1974, Ser. No. 432,035**
**Int. Cl. G03c 5/00**
**U.S. Cl. 96—36** **30 Claims**

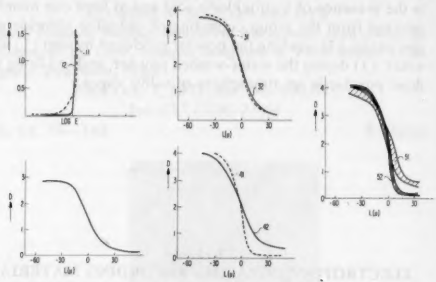


1. In a method of making die plates having a planned layout of lands thereon which project from a main body of the die plates and which cut and/or crease material, the steps of: (a) providing a sheet having a light transmitting base and an opaque coating thereon and making a master negative from said sheet by forming light transmitting lines in the coating to produce line images thereon and to define between said lines at least two areas on said opaque coating; (b) providing a sheet material comprising a light transmitting base sheet having a removable light-sensitive opaque coating thereon, exposing said sheet to light through said master negative to form line images defining at least two areas in said opaque coating corresponding to said line images defining said at least two areas in said master negative opaque coating; (c) removing coating from at least one but less than all of the areas defined by said lines in said first sheet to render at least one area thereof light transmitting and thereby to produce on said sheet an image of the planned layout of the lands on one of said die plates; (d) exposing a light hardenable resist coating on a plate in accordance with said image of the planned layout on said sheet to harden an area of the resist on said plate, and etching said plate in the unhardened areas thereof to produce a first of said die plates; (e) repeating steps (b), (c) and (d) with at least one other sheet material and at least one other plate to produce at least one other of said die plates.

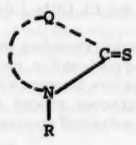
## 3,895,948
## SILVER HALIDE LIGHT-SENSITIVE MATERIAL CONTAINING A HETEROCYCLIC THIONE AND A POLYALKYLENE OXIDE

**Keisuke Shiba; Seiiti Kubodera; Reiichi Ohi; Tadao Shishido; Nobuo Yamamoto, and Takeo Sakai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan**

**Filed Dec. 29, 1972, Ser. No. 319,815**
**Claims priority, application Japan, Dec. 28, 1971, 47-3037**
**Int. Cl. G03c 1/06, 1/28**
**U.S. Cl. 96—76 R** **10 Claims**



1. A silver halide light-sensitive material which comprises in a silver halide emulsion layer or a layer adjacent thereto at least one heterocyclic thioketone compound which does not form a mercapto group through tautomerism, said compound being represented by the following general formula (I):



(I)

wherein Q represents the group of atoms necessary to form a heterocyclic ring selected from the group consisting of benzothiazoline-2-thione ring, benzoselenazolin-2-thione ring, benzoxazolin-2-thione ring, imidazolin-2-thione ring, benzimidazolin-2-thione ring, selenazolidin-2-thione ring, 4-selenazolin-2-thione ring, 1,3,4-thiodiazolin-2-thione ring, 1,3,4-selenadiazoline-2-thione ring, 1,2-dihydropyridin-2-thione ring, 1,2-dihydroquinolin-2-thione ring, 4,5-tetramethylenethiazolin-2-thione ring, 4,5-trimethylenethiazoline-2-thione ring, naphthothiazolin-2-thione ring, and thiazolidin-2-thione ring, and R represents an unsubstituted alkyl group, an aralkyl group an aryl group, a 2-pyridyl group or a dipyridyl group and at least 1 polyalkylene oxide derivative having a molecular weight ranging from 500 to 12,000 selected from the group consisting of

a. block copolymers of alkylene oxide,
b. polyalkyleneglycols,
c. addition polymerization products between alkylene oxides and a compound selected from the group consisting of an aliphatic alcohol, an aromatic alcohol, glycols, fatty acids, organic amines, and a dehydrated compound of hexitol derivatives, and
d. condensates of a polyalkylene oxide with said compound, the combination of said thioketone compound and said polyalkylene oxide derivative being incorporated in said layer in concentrations which provide a high edge gradient with comparatively short development time and/or

dots having good toe-gradation when said material is developed.

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**3,895,949**

## PHOTOSENSITIVE ELEMENT COMPRISING PHOTOPOLYMERIZABLE LAYER AND PROTECTIVE LAYER

**Kiyoshi Akamatsu, Tokyo; Yuzo Yokota, Doimachi; Hiroshi Sagami, Shiki-shi, and Isao Imai, Niiza-shi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka City, Japan**

**Filed July 17, 1973, Ser. No. 380,018**

**Claims priority, application Japan, July 24, 1972, 47-73976**

**Int. Cl. G03c** *1/68, 1/70*

**U.S. Cl. 96—86 P** **9 Claims**

1. A photosensitive element comprising, in order,

1. a support,

2. a layer of a photopolymerizable composition comprising

a. about 100 parts by weight of an addition polymerizable polymeric compound obtained by esterification reaction of a copolymer having pendent carboxyl groups with about 0.03 to 1.0 equivalent, based upon the carboxyl groups of said copolymer, of an ethylenically unsaturated compound having one oxirane ring,

b. about 5 to 70 parts by weight of at least one ethylenically unsaturated compound and

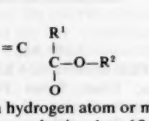
c. about 0.0001 to 10 parts by weight of a photopolymerization initiator, said copolymer being obtained by copolymerizing

i. about 10 to 95 percent by weight of at least one member selected from the group consisting of styrene and the methyl-substituted styrene derivatives,

ii. about 5 to 70 percent by weight of at least one ethylenically unsaturated mono- or dicarboxylic acid, its anhydride or its monoester with an alkanol of 1 to 4 carbon atoms,

iii. up to about 30 percent by weight of at least one member selected from the group consisting of acrylonitrile and methacrylonitrile,

iv. up to about 85 percent by weight of at least one compound of the formula



wherein $R^1$ represents a hydrogen atom or methyl group; and $R^2$ represents an alkyl group having 1 to 12 carbon atoms,

v. up to about 50 percent by weight, based upon the total weight of said compounds (iii) and (iv), of at least one vinyl ester of a saturated aliphatic monocarboxylic acid having 2 to 10 carbon atoms, and

3. a protective layer having a thickness of about 0.5 to 20 microns, said protective layer being transparent to actinic radiation, substantially impermeable to oxygen, insoluble in water, non-strippable as an unsupported film and composed of a copolymer having a degree of polymerization of about 100 to 1,000 and being obtained by reaction between

a. about 10 to 70 percent by weight of an unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid and itaconic acid and

b. at least one ethylenically unsaturated compound comprising (i) up to about 40 percent by weight of at least one ethylenically unsaturated compound, as a hard component, selected from the group consisting of styrene, alpha-methylstyrene, methyl methacrylate, acrylonitrile and methacrylonitrile and (ii) about 50 to 30 percent by weight of at least one ethylenically unsaturated compound, as a soft component, selected from the group consisting of methyl acrylate, ethyl acrylate, n-propyl acrylate, n-butyl acrylate, 2-ethylhexyl acrylate and n-octyl methacrylate,

said protective layer being applied from an aqueous solution obtained by neutralizing said copolymer with about 0.4 to 1.0 mole, per mole of the carboxyl groups of said copolymer, of a member selected from the group consisting of diethylamine, triethylamine, isopropylamine, ethanolamine, diethanolamine, morpholine and ammonia.

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**3,895,950**

## PHOTOGRAPHIC MATERIAL WITH IMPROVED ANTISTATIC PROPERTIES

**Julius Geiger, Odenthal; Günter Meinhardt, Leverkusen, and Werner Wagenknecht, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany**

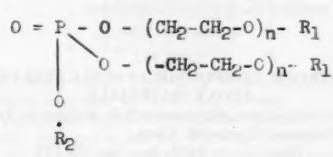
**Continuation of Ser. No. 252,026, May 10, 1972, abandoned. This application July 16, 1974, Ser. No. 489,069**

**Claims priority, application Germany, May 12, 1971, 2123455**

**Int. Cl. G03c** *1/78*

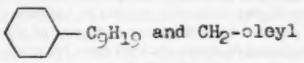
**U.S. Cl. 96—87 A** **3 Claims**

1. A light sensitive photographic material having improved antistatic properties containing at least one silver halide gelatin emulsion layer and a layer containing a binder and silica obtained by pyrogenic method and having a BET value of between 50 and 110 $m^2/g$ and in said silica-containing layer an orthophosphoric acid ester of the following formula:



in which

$R_1$ × an aliphatic group with up to 18 carbon atoms,



$R_2$ = H or $(CH_2.CH_2.O)_n - R_1$ and

$n$ = 4– 15, **15,**

and in which layer the total weight of phosphoric acid ester and silica is 1 to 33.5% of the weight of layer binder of the photographic layer and the proportion of phosphoric acid ester to silica is between 1:10 and 10:1.

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**3,895,951**

## SILVER HALIDE EMULSION SUPERSENSITIZED WITH A MEROCYANINE DYE AND A TERTIARY PHOSPHINE SULFIDE

**Oskar Riester, Leverkusen, and Hans Ohlschlager, Cologne, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany**

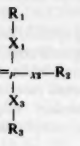
**Filed Sept. 24, 1973, Ser. No. 400,238**

**Claims priority, application Germany, Sept. 29, 1972, 2247893**

**Int. Cl. G03c** *1/40, 1/08, 1/28, 1/34*

**U.S. Cl. 96—100** **3 Claims**

1. A light sensitive photographic material comprising at least one silver halide emulsion layer containing a merocyanine spectral sensitizing agent and a sensitizing and stabilizing tertiary phosphine sulfide having the general formula:



wherein

$R_1$ and $R_2$ may be the same or different and represent a saturated aliphatic hydrocarbon group; a cycloalkyl group; an aralkyl group an aryl group; a heterocyclic group comprising a 5-, 6- or 7-membered heterocyclic ring;

and $R_1$ and $R_2$ together with the phosphorus atom may form a phospholine ring;

$R_3$ represents a saturated or unsaturated aliphatic hydrocarbon group; a cycloalkyl group; an aralkyl group; an aryl group; a heterocyclic group comprising a 5-, 6- or 7-membered heterocyclic ring; a hydroxyl group or a thiol group;

$X_1$ and $X_2$ and $X_3$ represent a chemical bond or linking member containing hetero-atoms and being selected from the group consisting of —O—, —S—, —Se—, —$NR_4$—(- wherein $R_4$ stands for hydrogen, alkyl, aralkyl or cycloalkyl), —NH—N=, —NH—NH—$SO_2$—, —NH—$SO_2$—, —NH—CO—, —NH—CS—, —NH—CS—, —NH—C-S—NH— and —NH—NH—CS—NH—;

$X_1$, $X_2$ and $X_3$ may be the same or different but do not simultaneously all three represent —O—, said phosphine sulfides being present in an effective amount to increase and stabilize the spectral sensitization.

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3,895,952

## PHOTOTROPIC COMPOUNDS AS ACID CATALYST FOR EPOXY MATERIALS

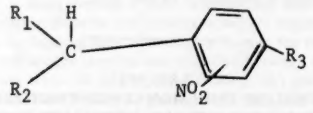
Sheldon I. Schlesinger, Hightstown, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 9, 1973, Ser. No. 331,179
Int. Cl. G03c 1/68; C01j 1/10, 1/12
U.S. Cl. 96—115 R 14 Claims

1. A photopolymerizable composition comprising:

a monomeric or prepolymeric epoxide material, polymerizable to higher molecular weights by cationic polymerization, selected from the group consisting of glycidyl ethers of bisphenol A, epoxy-cycloalkanes, epoxy-cycloalkenes, epoxy-alkanes, glycidyl alkyl ethers, epoxy-novolacs and allyl glycidyl ether-glycidyl methacrylate copolymer

in admixture with a phototropic aromatic compound containing at least one nitro radical in a position ortho to an alkyl substituent selected from compounds having the formula:



wherein $R_1$ and $R_2$ are selected from the group consisting of hydrogen, alkyl, aryl, carbalkoxy, pyridyl, carbazolyl, N-oxidopyridyl nitroalkyl, nitroaryl, dinitrophenyl, alkaryl, aralkyl, haloalkyl and haloaryl radicals and $R_3$ is selected from the group consisting of hydrogen, alkyl, aryl, nitroalkyl, nitroaryl, alkaryl, aralkyl, haloalkyl, haloaryl radicals and electron-withdrawing groups selected from $—NO_2$, —CN, —COOR, —COR, $—NR_3$, —Br, —Cl, —F, —I, —RCOX, $—RX_3$, —NO, RCO—, and $R_2NCO$— wherein X is halogen and R is alkyl; said phototropic compound being reversibly converted upon exposure to actinic or electron beam radiation to provide an acid form of said compound effective to initiate cationic polymerization of said epoxide material.

3,895,953

## ADMIXTURES FOR REDUCING SLUMP LOSS IN HYDRAULIC CEMENT CONCRETES

Povindar K. Mehta, El Cerrito, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 11, 1974, Ser. No. 432,514
Int. Cl. C04l 7/03
U.S. Cl. 106—88 7 Claims

1. A composition for reducing early slump loss in hydraulic cement concretes comprising a mixture of an hydraulic cement, sand, gravel, water and a styrene-butadiene latex present, on a solids basis, in an amount of from about 0.1 to about 1.5% by weight of the cement.

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3,895,954

## EPOXY RESIN PHOTORESIST WITH IODOFORM AND BISMUTH TRIPHENYL

Jerome Roteman, Solon, Ohio, assignor to American Can Company, Greenwich, Conn.

Filed June 11, 1973, Ser. No. 369,086
Int. Cl. G03c 1/68, 1/04; C01j 1/10; D01j 1/12
U.S. Cl. 96—115 R 8 Claims

1. A polymerizable composition comprising a polymerizable material consisting essentially of:

a monomeric or prepolymeric epoxide material or mixture thereof, said epoxide material being polymerizable to higher molecular weights through the action of a cationic catalyst;

a radiation-sensitive catalyst precursor which decomposes upon exposure to actinic or electron-beam radiation to provide an active cationic catalyst effective to initiate cationic polymerization of said epoxide material, said precursor being an organohalogen compound wherein the organo radicals are alkyl, aryl, alkaryl, aralkyl alkoxy and aroxy in combination with an organometallic compound having the formula $R_3M$ wherein M is P, Sb, As or Bi and R is a hydrocarbyl radical or hydrogen with the proviso that at least one R is a hydrocarbyl radical.

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3,895,955

## PROCESS FOR BURNING CEMENT CLINKER

Marekata Kondo, Yono; Seiwa Fukuda, Kawagoe, and Toyohiko Yamamoto, Omiya, all of Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1973, Ser. No. 390,400
Claims priority, application Japan, Aug. 31, 1972, 47-86610
Int. Cl.² C04B 7/36
U.S. Cl. 106—100 2 Claims

1. In a process for burning cement clinker which comprises feeding cement raw material from a feeder to a multi-stage preheating zone, heat exchanging successively said cement raw material with a combustion gas from a combustion zone through said multi-stage preheating zone, burning to cement clinker in a non-fluidized state the heat exchanged cement raw material in said combustion zone with the aid of fuel and cooling said cement clinker, the improvement with comprises introducing a part of said cement raw material heat exchanged from said multi-stage preheating zone into a fluidized calcining zone having a separate heat source where said part thereof is calcined in a fluidzied bed, introducing a waste gas from said calcining zone which entrains the calcined cement ras material to a final stage of said multi-stage preheating zone where the calcined cement raw material is separated from said waste gas and brought to be mixed with another part of the heat exchanged cement raw material which has not been introduced into said fluidized calcining zone, and then feeding the calcined and the heat exchanged cement raw materials to said combustion zone to produce a burned cement clinker.

3,895,956

## WATER PERMEABILITY REDUCING INORGANIC COATING SLURRY COMPOSITION

Akitoshi Yoshida; Koichi Asahara; Koichiro Yanagida; Tadanobu Maruyama; Ikue Takatsu, and Yoshiko Kumagai, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Aug. 21, 1973, Ser. No. 389,635
Claims priority, application Japan, Aug. 21, 1972, 47-83534
Int. Cl. C08b *27/04*; C08f *45/24*
U.S. Cl. 106—193 R 10 Claims

1. A coating slurry composition with reduced water permeability which comprises 5 – 700 parts by weight of an inorganic filler other than a water swellable magnesium silicate or bentonite, 0.1 – 30 parts by weight of a water swellable magnesium silicate, bentonite, or mixtures thereof, 0.1 – 50 parts by weight of a water repellent, selected from the group consisting of an alkali alkyl siliconate and inorganic powders coated with an alkali alkyl siliconate or a fatty acid or salts thereof, 0.01 – 10 parts by weight of an organic viscosity improver selected from the group consisting of a monovalent alkali metal, ammonium or amine salt of a polyacrylic acid having a degree of polymerization of at least 2000, polyethyleneoxide of 500,000 molecular weight and a water soluble cellulose derivative and 100 parts by weight of a silica sol containing a silica component ranging from 3 – 50 weight percent and at least one alkali component wherein the mole ratio of $SiO_2$ to $M_2O$ is greater than 4 and wherein $M_2O$ represents an alkali metal oxide, ammonium hemihydrate, an amine hemihydrate, guanidine hemihydrate or hydrazine hemihydrate.

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3,895,957

## METHOD FOR CLEANSING SURFACES OF BUILDINGS AND PASSAGE-WAYS

Klaus Scheel, Herscheider Landstrasse 47, 588 Ludenscheid, and Wolfgang Luthe, Kunostrasse 8, 58 Hagen, both of Germany

Filed Apr. 23, 1973, Ser. No. 353,367
Claims priority, application Sweden, Apr. 26, 1972, 5496/72
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—34 1 Claim

1. Method of cleansing the exterior surface of a building of masonry, stone, brick or the like, comprising

a. directing a jet of water at a temperature not less than about 100°C. from a nozzle at a pressure of about 20 atm against the surface to be cleaned,

b. disposing said water jet at approximately right angles to such surface with the end of the nozzle spaced at a maximum distance of about 2 cm from the surface, and

c. moving the water jet parallel to such surface while maintaining same in said right angle position, whereby due to the proximity of the jet to such surface the greater volume of water does not vaporize before touching the surface and part of the water is forced into the pores for achieving vaporization therein.

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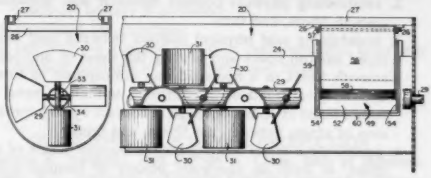
3,895,958

## CONTINUOUS FLOW COUNTER-CURRENT LIQUID AND SOLID CONTACT APPARATUS

William N. Gill, Eggertsville; Mahendra R. Doshi, Buffalo, both of N.Y., and Robert E. Adams, Topsfield, Mass., assignors to J. W. Greer, Inc., Wilmington, Mass.

Filed Feb. 8, 1973, Ser. No. 330,888
Int. Cl. B08b *3/08*
U.S. Cl. 134—60 8 Claims

8. A liquid and solids continuous contact counter flow apparatus comprising a body portion defining at least a trough, a rotary shaft extending longitudinally through said trough, a plurality of spaced generally radial paddles on said shaft collectively forming an interrupted helical distribution on said shaft, said paddles including relatively flat blades and



relatively curved scoops, said paddles being arranged as pairs of oppositely radially directed scoops and blades.

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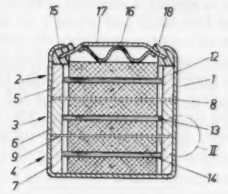
3,895,959

## SEALED, GAS-TIGHT ELECTRIC STORAGE BATTERY

Klaus H. Dehmelt, Oberjasse 28, 6374 Steinbach, Tannus, Germany

Filed Oct. 18, 1974, Ser. No. 516,096
Claims priority, application Germany, Oct. 27, 1973, 2353958
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 R 14 Claims



1. An electric battery comprising, in combination:

a. a metal container having a filler opening,

b. a plurality of stacked spacer rings disposed in the container, arranged to line the side walls thereof,

c. isolator plates interposed between adjacent spacer rings and sealing therewith to form a plurality of sealed compartments in the container,

d. electric cell elements respectively in said compartments,

e. said isolator plates having means to establish electrical contact between an element of one cell and an element of an adjoining cell,

f. a cover fitted to the filler opening of the container, and

f. means sealing the cover to the container.

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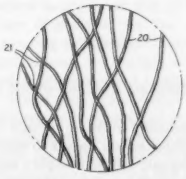
3,895,960

## DIFFUSION-BONDED BATTERY ELECTRODE PLAQUES

Jack T. Brown; William Feduska, both of Pittsburgh, Pa., and Wesley L. Bradford, Pentress, W. Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1970, Ser. No. 67,567
Int. Cl. H01m *35/04*
U.S. Cl. 136—36 4 Claims



1. A method of producing battery electrode plaques by:

1. providing a sheet of intermingled relatively smooth unoxidized metallic fibers being essentially free of clefts and

protuberances, said fibers having a diameter of about 0.0002 to 0.015 inches, and then

2. establishing physical contact between said unoxidized smooth fibers, and then
3. maintaining said physical contact between said unoxidized smooth fibers and heating the sheet of unoxidized smooth fibers in a non-oxidizing atmosphere to form a metallurgical bond of interdiffused unmelted metal between fibers at points of physical contact by an interdiffusion of atoms between the fibers, and finally
4. depositing a metal coating on the bonded fibers of said sheet, to form an electrode plaque of bonded coated fibers essentially free of clefts and protuberances.

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**3,895,961**

## ELECTRODEPOSITION OF IRON ACTIVE MASS

**Ian Paul Gutridge, Kingswinford, England, assignor to The International Nickel Company, Inc., New York, N.Y.**

**Continuation of Ser. No. 313,446, Dec. 8, 1972, abandoned. This application July 29, 1974, Ser. No. 492,591**
**Int. Cl. H01m *35/30***
**U.S. Cl. 136—76** **7 Claims**

1. An electrolytic process for forming negative, hydroxidic iron active mass on a metal foil in which the active mass as electrolytically deposited is adherent to the foil and comprises essentially iron hydroxide and about 1 to about 20 percent total by weight of copper comprising electrolytically depositing said active mass onto said metal foil from an aqueous electrolyte containing ferrous ions, nitrate ions and a salt of copper and having a bulk pH of about 0.5 to about 3 at a cathode current density of about 10 to 100 milliamperes per square centimeter for a period of time sufficient so that the weight of the deposit at least equals the weight of the foil.

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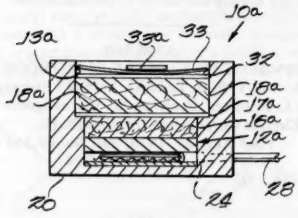
**3,895,962**

## SOLID STATE BATTERY AND METHOD OF MAKING THE SAME

**Ralph T. Mead, Kenmore, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.**

**Division of Ser. No. 230,923, March 1, 1972, Pat. No. 3,773,557. This application Nov. 9, 1973, Ser. No. 414,305**
**Int. Cl. H01m *31/00***
**U.S. Cl. 136—83 R** **10 Claims**




1. A method of making a lithium-iodine cell comprising the steps of:
   a. providing a housing of non-conductive material;
   b. placing a lithium anode means in said housing;
   c. pouring an organic-iodine complex into said housing and into operative contact with a lithium surface of said anode means, said complex being formed by reacting a polymer with iodine in the presence of heat; and
   d. placing a cathode means in operative relationship with said complex.

**3,895,963**

## PROCESS FOR THE FORMATION OF BETA ALUMINA-YPE CERAMICS

**H. Christopher McGowan; Joseph A. Male, both of Piscataway, and Malcolm G. McLaren, Milford, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.**

**Filed Dec. 20, 1972, Ser. No. 316,731**
**Int. Cl. H01m *11/00***
**U.S. Cl. 136—153** **14 Claims**

1. A process for the preparation of a crystalline beta alumina-type ceramic comprising a major amount of beta'' alumina having the steps of
   a. preparing a homogeneous mixture comprising powders of alpha alumina and an alkali metal oxide, the alumina/alkali metal oxide mole ratio in the mixture ranging between about 5 and about 11,
   b. calcining said mixture at a temperature ranging between about 850° and 1150°C., said temperature being insufficient to cause substantial reaction of alpha alumina and alkali metal oxide to form a material selected from the group consisting of beta or beta'' alumina,
   c. forming said calcined mixture thereby obtaining a dense green containing a major amount of alpha alumina, and d. sintering the green body at a temperature ranging between about 1450° and 1700°C., thereby obtaining a crystalline beta alumina-type ceramic comprising a major amount of beta'' alumina.

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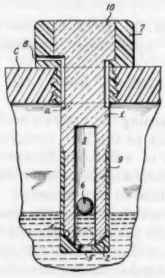
**3,895,964**

## STORAGE BATTERY FOR VEHICLES

**Akira Sakamoto, Kureme, Japan, assignor to Daiden Co., Inc., Fukuoka, Japan**

**Filed July 18, 1973, Ser. No. 380,337**
**Claims priority, application Japan, Aug. 2, 1972, 47-91022**
**Int. Cl. H01m *31/04***
**U.S. Cl. 136—182** **8 Claims**




1. In a storage battery having at least one cell containing a liquid electrolyte which should be maintained at at least a predetermined minimum level and a cap for said cell, the improvement according to which the lower part of said cap extends downwardly to said minimum level and defines a central chamber open at its bottom to admit said electrolyte, the portion of said cap directly above said chamber being transparent and said chamber having a light reflective bottom wall portion inclined downwardly toward and encircling said opening, and a transparent colored float in said chamber which is larger in diameter than said opening but smaller than the outer diameter of said inclined wall portion and has a specific gravity less than the specific gravity of said electrolyte when said cell is fully charged, whereby when said colored float is resting on said bottom wall portion, only the color of said float may be seen through said transparent material due to reflection of said color by said bottom wall portion, whereas a ring of a different color may be seen encircling said float when said float is above said bottom wall portion.

## 3,895,965
## METHOD OF FORMING BURIED LAYERS BY ION IMPLANTATION

**Alfred Urquhart MacRae, Berkeley Heights, N.J.; Paul Miller, Allentown, Pa.; Robert Alan Moline, Gillette, and John Simpson, Bernardsville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation-in-part of Ser. No. 146,252, May 24, 1971, abandoned. This application May 24, 1973, Ser. No. 363,401**

**Int. Cl.[2] H01L** *7/54, 7/36*

**U.S. Cl. 148—1.5** **14 Claims**

1. A method for forming a silicon device which includes a buried impurity layer comprising the steps of:

implanting impurities into a surface region of a silicon substrate by exposing the surface to a beam containing impurity ions for an exposure of at least $10^{14}$ ions/cm$^2$ and at an accelerating voltage such that the silicon surface is damaged to a depth which is greater than the average depth of ion penetration whereby the major fraction of the implanted ions are in the damaged region;

heating the substrate in an oxidizing ambient for a time and at a temperature sufficient to oxidize the surface of the substrate to a depth greater than the average depth of ion penetration while diffusing the majority of impurities out of the damaged region deeper into the substrate;

removing the oxide layer; and

growing an epitaxial layer on the surface of the substrate.

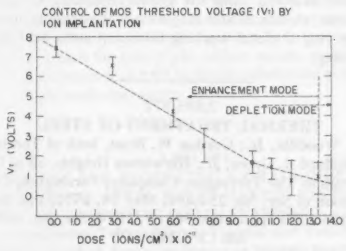
## 3,895,966
## METHOD OF MAKING INSULATED GATE FIELD EFFECT TRANSISTOR WITH CONTROLLED THRESHOLD VOLTAGE

**John D. MacDougall, and Kenneth E. Manchester, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.**

**Filed Sept. 30, 1969, Ser. No. 862,238**

**Int. Cl. H01l** *7/54*

**U.S. Cl. 148—1.5** **5 Claims**




1. A method of making at least one IGFET on one semiconducting wafer with precisely controlled threshold voltages for each IGFET formed, including the steps of:

a. doping a semiconducting substrate to form at least one pair of spaced apart souce and drain regions within said substrate and of opposite conductivity type from said substrate;

b. forming an insulating layer on said substrate surface between said source and drain region of each IGFET, and a fixed surface state charge density within the insulating layer and concentrated at the layer substrate interface;

c. subsequently introducing at about room temperature a controlled quantity of dopants into the gate and channel region between said source and drain of selected IGFET's through said insulating layer by masking other devices on said substrate and exposing each unmasked insulator and underlying channel to an energetic ion beam to produce in the channel an implanted doping layer having at least one concentration of ion beam implanted impurity ions, whereby the charge density per unit area within an active channel region is modified and a specific threshold or pinch-off voltage is provided;

d. annealing the structure;

e. depositing a metallic gate over said implanted layer and metallic contacts to said source and drain.

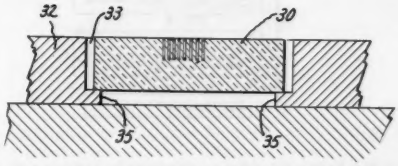
## 3,895,967
## SEMICONDUCTOR DEVICE PRODUCTION

**Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 30, 1973, Ser. No. 411,006**

**Int. Cl. H01l** *7/34*

**U.S. Cl. 148—1.5** **3 Claims**




1. In the thermal gradient zone melting method of semiconductor device production including the steps of providing a deposit of a suitable metal in solid form as a migration droplet source within a first surface of a matrix body of semiconductor material, providing a heat source body to melt the deposited metal and cause the resulting droplet to migrate through the matrix body in the direction of a second surface of the matrix body, and placing the matrix body in juxtaposition to the heat source body, the combination of the step of providing a high heat conductivity gas at pressure between **0.1** and **10** atmospheres one portion of which is in heat exchange contact with the heat source and the second surface of the matrix body to deliver heat by conduction uniformly to the matrix body's second surface and the other portion of which is in heat exchange contact with the first surface of the matrix body and a relatively colder body to remove heat continuously from the matrix body.

## 3,895,968
## METHOD OF MAKING FINISHED STEEL CASTINGS

**Paul L. McCulloch, and Burton O. Heinrich, both of 1442 N. Memorial Dr., Racine, Wis. 53404**

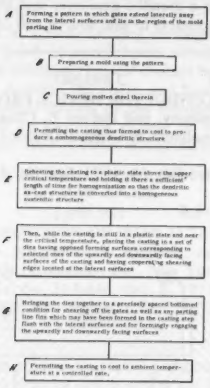
**Filed Jan. 7, 1974, Ser. No. 431,233**

**Int. Cl. C21d** *5/00;* **B22d** *31/00*

**U.S. Cl. 148—2** **12 Claims**

1. The method of making a finished steel casting having lateral surfaces as well as upwardly and downwardly facing surfaces, which comprises: forming a pattern in which gates extend laterally away from the lateral surfaces and lie in the region of the mold parting line, and in which the upwardly and downwardly presented surfaces are free of extraneous protuberances in the form of gates or the like, preparing a mold using the pattern, pouring molten steel therein, permitting the casting thus formed to cool to produce a nonhomogeneous as-cast grain structure, reheating the casting to a plastic state above the upper critical temperature and holding it there a sufficient length of time for homogenization so that the as-cast grain structure is converted into a homogeneous austenitic structure, then, while the casting is still in a plastic state and near the holding temperature, placing the casting in a set of dies having opposed forming surfaces corresponding to selected ones of the upwardly and downwardly facing surfaces of the casting and having cooperating shearing edges located at the lateral surfaces, bringing the dies together for shearing of the gates as well as any parting line fins which may have

been formed in the casting step flush with the lateral surfaces and for formingly engaging the upwardly and downwardly


A
Forming a pattern in which gates extend laterally away from the lateral surfaces and lie in the region of the mold parting line
B
Preparing a mold using the pattern
C
Pouring molten steel therein
D
Permitting the casting thus formed to cool to produce a nonhomogeneous dendritic structure
E
Reheating the casting to a plastic state above the upper critical temperature and holding it there a sufficient length of time for homogenization so that the dendritic as-cast structure is converted into a homogeneous austenitic structure
F
Then, while the casting is still in a plastic state and near the critical temperature, placing the casting in a set of dies having opposed forming surfaces corresponding to selected ones of the upwardly and downwardly facing surfaces of the casting and having cooperating shearing edges located at the lateral surfaces
G
Bringing the dies together to a precisely spaced bottomed condition for shearing off the gates as well as any parting line fins which may have been formed in the casting step flush with the lateral surfaces and for formingly engaging the upwardly and downwardly facing surfaces
H
Permitting the casting to cool to ambient temperature at a controlled rate.

facing surfaces, and finally permitting the casting to cool at a controlled rate.

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**3,895,969**

## COMPOSITION AND PROCESS FOR INHIBITING CORROSION OF NON-FERROUS METAL SURFACED ARTICLES AND PROVIDING SURFACE FOR SYNTHETIC RESIN COATING COMPOSITIONS

**Russell C. Miller, Chicago, Ill., assignor to J. M. Eltzroth and Associates Inc., Schaumberg, Ill.**

**Continuation-in-part of Ser. No. 137,682, April 26, 1971, Pat. No. 3,755,018. This application June 13, 1973, Ser. No. 369,479. The portion of the term of this patent subsequent to Aug. 28, 1970, has been disclaimed.**

**Int. Cl. C23f** *7/26*

**U.S. Cl. 148—6.2** **17 Claims**

1. A process for treating non-ferrous metal surfaced articles to improve corrosion resistance and receptivity to synthetic resin coatings which comprises bringing said articles into contact with a chromate depositing solution containing as essential components hexavalent chromium and trivalent chromium together with an acid from the group consisting of fluoboric acid, fluosilicic acid, hydrofluoric acid and mixtures thereof in sufficient amount to enhance adherency of the resultant surface to organic film forming polymers which dry to a water resistant coating, said chromate depositing solution having a solids content within the range from 0.2 gram per liter to 75.0 grams per liter, the remainder being water, and consisting essentially of the following:

| Ingredients | Grams per Liter |
|---|---|
| Hexavalent chromium (expressed as Cr) | 0.05–50.0 |
| Trivalent chromium (expressed as Cr) | 0.03–5.0 |
| Fluoride or bifluoride (expressed as F) | 0.03–3.0 |
| Borate (expressed as $B_2O_3$) | 0.01–3.0 |
| Fluoborate (expressed as $BF_4$) | 0.03–10.0 |
| Sulfate (expressed as $SO_4$) | 0.01–3.0 |
| Magnesium (expressed as Mg) | 0.01–3.0 |
| Aluminum (expressed as Al) | 0.01–3.0 |
| Iron (expressed as Fe) | 0.01–0.05 |
| Nickel (expressed as Ni) | 0.01–0.05 |
| Acetate (as acetate radical) | 0.0–0.1 |

with the further proviso that the weight ratio of trivalent chromium as Cr to hexavalent chromium as Cr is at least 1:100 but no more than 200:1, and the pH of said solution is between 0.8 and 5.0.

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**3,895,970**

## SEALING RINSE FOR PHOSPHATE COATINGS OF METAL

**William A. Blum, Fort Washington, and Kurt Goltz, Exton, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.**

**Filed June 11, 1973, Ser. No. 365,019**

**Int. Cl. C23f** *7/08*

**U.S. Cl. 148—6.15 R** **5 Claims**

3. The process of sealing a phosphate coating on a metal comprising wetting the phosphate coated metal with the composition consisting essentially of an acidic aqueous fluoride solution free of chromates and having a pH within the range of about 3 to about 7 and containing fluoride ion at a concentration ranging from about 0.01 to about 25 grams/liter which is supplied by at least one of the members selected from the group consisting of calcium fluoride, zinc fluoride, aluminum fluoride, titanium fluoride, zirconium fluoride, chromic fluoride, chromic zirconium fluoride, nickel fluoride, ammonium fluoride, hydrofluoric acid and fluoboric acid, drying the said fluoride solution on the said wetted metal and thereafter rinsing the metal with water and redrying the metal.

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**3,895,971**

## METHOD OF LUBRICATING AN ALUMINUM WORKPIECE

**Albert H. Bushey, and Ewell E. McDole, both of Danville, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.**

**Filed May 18, 1973, Ser. No. 361,763**

**Int. Cl. C23f** *7/06, 17/00*

**U.S. Cl. 148—6.27** **8 Claims**

1. A method of applying a lubricant to an aluminum workpiece prior to the cold working thereof consisting essentially of:

a. forming a tenacious coating of complex alkaline earth metal aluminates on the surface of the aluminum workpiece by treating said workpiece in an alkaline solution at a temperature of at least 100°F containing at least 0.1 gram/mol per liter of a soluble alkaline earth metal compound selected from the group consisting of calcium, barium, strontium and magnesium compounds; and

b. applying a metal working lubricant onto said formed coating.

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**3,895,972**

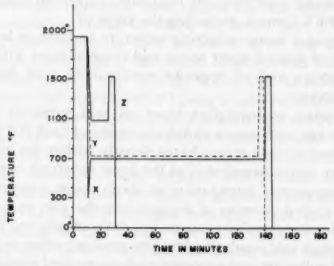
## THERMAL TREATMENT OF STEEL

**John E. Woodilla, Jr.; Gordon W. Hunt, both of Torrington, and Willard B. Green, Jr., Harwinton Heights, all of Conn., assignors to The Torrington Company, Torrington, Conn.**

**Division of Ser. No. 254,454, May 18, 1972, Pat. No. 3,826,694. This application May 9, 1974, Ser. No. 468,497**

**Int. Cl. C21d** *1/78*

**U.S. Cl. 148—12.1** **1 Claim**




1. A method for producing hardened hypereutectoid steels of less than about 10 percent total alloy resulting in a structure

with an ultra-fine grain size free from microcracks, and very small well dispersed excess carbides comprising the steps of: heating the material to a temperature not exceeding the solidus for a time sufficient to dissolve the carbides present in the initial microstructure,

quenching quickly into a suitable liquid quench medium to the approximate range of 900° to 1333°F to produce pearlite,

when the pearlite transformation is complete, cooling to a suitable temperature for mechanical deformation, and mechanically deforming the material then,

rapidly heating through the $A_{1,3}$ and $A_{cm}$ temperature range of its equilibrium diagram to the austenitizing temperature for the material for a controlled time only sufficient to convert the carbide lamellae within the pearlite into very small excess carbides and transform the ferrite to austenite, and,

quenching to harden the steel.

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**3,895,973**

**ACTIVATED SOLDERING FLUX**

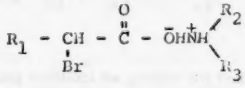
**Robert A. Stayner, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Dec. 17, 1973, Ser. No. 425,673**

**Int. Cl. C23c 1/12**

**U.S. Cl. 148—25** **22 Claims**

1. A flux composition for low-melting point alloys comprising a rosin and an amount effective to improve the ability of said rosin to clean a surface to be soldered and to prepare said surface to receive solder of an activator agent comprising an amine salt of an alpha-bromo-aliphatic carboxylic acid, wherein said amine salt has the following formula



wherein (a) $R_1$ represents a hydrocarbyl containing 4 to 20 carbon atoms and 0 to 2 sites of olefinic unsaturation, and (b) $R_2$ and $R_3$ each independently represent hydrogen or a hydrocarbyl, in which the sum of the carbon atoms contained in $R_2$ and $R_3$ is between 6 and 40 to insure substantial water insolubility of said activator agent.

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**3,895,974**

**PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING EXCELLENT MAGNETIC CHARACTERISTIC**

**Shozo Watanabe, Tokyo; Kiyoshi Tanaka, and Yozo Suga, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Japan**

**Filed Oct. 3, 1973, Ser. No. 402,908**

**Claims priority, application Japan, Oct. 11, 1972, 47101795**

**Int. Cl. H01f 1/04**

**U.S. Cl. 148—111** **2 Claims**

1. A process for producing a goss texture, grain-oriented electrical steel sheet having excellent magnetic characteristics greater than 1.85 Wb/m² comprising hot rolling a silicon sheet material consisting essentially of not less than 2% silicon, 0.01 to 0.45% acid soluble aluminium, 0.003 to 0.0095% nitrogen with the balance being iron and unavoidable impurities, cold rolling the hot rolled material to a final sheet thickness, subjecting the cold rolled sheet to decarburization annealing and further subjecting the sheet to a final annealing in a temperature range where the secondary recrystallisation proceeds in the presence of aluminium nitride as it exists in the steel sheet thus produced, wherein the hot rolled sheet is subjected to a light hot working of 3 to 20% in a temperature range between 700° to 900°C and is held in this temperature range for not less than 2 seconds prior to the cold rolling to precipitate aluminium nitride which is effective for the secondary recrystallisation at the stage of final annealing.

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**3,895,975**

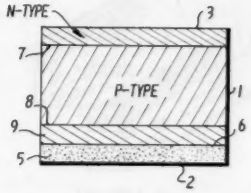
**METHOD FOR THE POST-ALLOY DIFFUSION OF IMPURITIES INTO A SEMICONDUCTOR**

**Joseph Lindmayer, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.**

**Filed Feb. 13, 1973, Ser. No. 331,740**

**Int. Cl. H01l 7/46**

**U.S. Cl. 148—178** **6 Claims**




1. In a method of fabricating a solar cell out of a slice of semiconductor material having first and second major surfaces which constitute the front light receiving surface and the back semiconductor surface, respectively, of the fabricated solar cell, said method being of the type wherein a p-n junction is formed by diffusing a dopant of a first type conductivity into said first major surface of said slice of semiconductor material having a second type conductivity opposite said first type conductivity, the improvement in said method comprising the steps of:

a. placing a layer of material on said second major surface of said slice prior to the formation of said p-n junction, said layer of material being characterized in that it will form an alloy with the semiconductor at temperatures below the melting point of said semiconductor material and it contains atoms which are dopant atoms of said second type conductivity,

b. heating said slice with said layer of material thereon to a temperature sufficient to cause said material to alloy with said semiconductor material and be in a molten state and said dopant atoms of a second type conductivity to diffuse into said slice from said material thereby forming a heavily doped region of said second type in said slice near said second major surface of said slice, and

c. subsequently diffusing said dopant of a first type conductivity into said first major surface from a gaseous mixture containing atoms of said dopant at a temperature above the melting point of said material and above the alloying and melting point of an alloy of said material and said semiconductor, wherein said semiconductor slice is silicon and said layer of material comprises a metal selected from the group consisting of aluminum, indium, gallium and thallium.

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**3,895,976**

**PROCESSES FOR THE LOCALIZED AND DEEP DIFFUSION OF GALLIUM INTO SILICON**

**Guy H. Dumas, Paris, France, assignor to Silec-Semi-Conducteurs, Paris, France**

**Filed Sept. 22, 1972, Ser. No. 291,479**

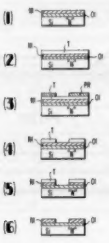
**Claims priority, application France, Sept. 27, 1971, 71.34698**

**Int. Cl. H07l 7/44**

**U.S. Cl. 148—187** **17 Claims**

1. In a process of localized and deep diffusion of gallium into silicon, wherein the following sequential operations are carried out:

a. preparation of the surface of a sample of N-type silicon intended to receive a diffusion localization mask;
b. deposition of a first oxide layer on said surface;
c. deposition of a silicon nitride layer forming a mask on the first oxide layer;
d. photoengraving of the mask by means of photosensitive product and a transfer layer formed by a second oxide layer; and opening of localized diffusion windows in the mask;
e. pre-diffusion of gallium into the silicon through said windows and through said first oxide layer and



f. removal of the silicon nitride mask and of the first oxide layer, the improvement comprising then
g. depositing a new first oxide layer on the whole silicon surface, followed by depositing a new layer of silicon nitride on this oxide layer;
h. thermally treating said sample to cause penetration diffusion of gallium into the silicon and
i. removing the layers of oxide and silicon nitride deposited during operation g), in order to obtain a structure with localized and deep P-N junctions.

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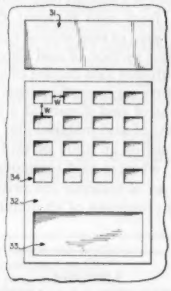
**3,895,977**

**METHOD OF FABRICATING A BIPOLAR TRANSISTOR**

**Thomas J. Sanders, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio**

**Filed Dec. 20, 1973, Ser. No. 426,584**
**Int. Cl. H01l** *7/34*
**U.S. Cl. 148—187** **4 Claims**



1. A process for fabricating transistors having approximately identical peak current gain, but different current capacities comprising the steps of:
forming base regions of first current capacity transistor and second current capacity transistor by diffusion;
forming an emitter region of said first current capacity transistor of a given effective area and an emitter region of said second current capacity transistor of a larger effective area than said given area so that both of said emitter regions have substantially identical impurity distribution by impurity deposition and diffusion through a mask having a plurality of identical area apertures; and
forming collector contact regions of said first and second current capacity transistors by diffusion.

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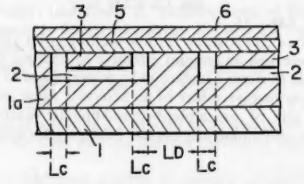
**3,895,978**

**METHOD OF MANUFACTURING TRANSISTORS**

**Yasuo Tarui; Yutaka Hayashi, both of Tokyo, and Toshihiro Sekigawa, Yokohama, all of Japan, assignors to Kogyo Gijutsuin, Japan**

**Division of Ser. No. 61,906, Aug. 7, 1970. This application July 6, 1971, Ser. No. 160,201**
**Claims priority, application Japan, Aug. 12, 1969, 44-63257; Sept. 18, 1969, 44-73849; Oct. 14, 1969, 44-81501; Oct. 14, 1969, 44-81502; Oct. 14, 1969, 44-81503; Oct. 20, 1969, 44-83209**
**Int. Cl. H01l** *7/44*
**U.S. Cl. 148—187** **7 Claims**




1. In a method for making an insulated gate field effect transistor having at least a semiconductor substrate, a first region of a first conductivity type in said semiconductor substrate, a second region of a second conductivity type in said semiconductor substrate, a gate insulating layer on the surface portion of said second region, a conductive gate eletrode on said gate insulating layer and third region of said first conductivity type in said semiconductor substrate, said first and third regions being separated by said second region, the improvement comprising the steps of,
a. forming a first diffusion mask on said semiconductor substrate,
b. forming in said first diffusion mask a first opening to expose the first surface portion of said semiconductor substrate and a second opening to expose the second surface portion of said semiconductor substrate, said first and second openings being separated by the remaining portion of said first diffusion mask,
c. forming a second diffusion mask on said exposed first and second surface portions of said semiconductor substrate and said remaining portion of said first diffusion mask,
d. forming in said second diffusion mask a third opening including said first opening and having an area larger than that of said first opening to expose again said first surface portion of said semiconductor substrate and not to expose said second opening,
e. diffusing a first impurity of a second conductivity type into said semiconductor substrate through said first opening exposed in said third opening to form said second region in said semiconductor substrate,
f. removing said second diffusion mask to expose said second opening, and
g. diffusing a second impurity of first conductivity type into said semiconductor substrate through said first and second openings to form said third region and said first region respectively.

## 3,895,979
## EXPLOSIVE OF REDUCED CAPACITY CONTAINING SILICEOUS FOAM PARTICLES

**Stefan Kraemer, Essen; Alois Seidl, Thurnstern, both of Germany, and Hans-Joachim Riedl, deceased, late of Recklinghausen, Germany (by Herta Emilie Riedl, legal representative), assignors to Wasag Chemie, Munich, Germany**

**Continuation of Ser. No. 73,625, Sept. 18, 1970, abandoned. This application Dec. 19, 1973, Ser. No. 426,306**

**Int. Cl. C06b** *19/00*

**U.S. Cl. 149—2** **5 Claims**

1. A novel explosive charge having a reduced explosive capacity comprising an explosive in the form of a powder, a slurry or a semi-plastic or plastic mass and a content of porous filler particles which do not take part in the detonation reaction and will, therefore, not influence the fume composition, particularly the carbon monoxide content, said filler particles being selected from the group consisting of foam glass particles melting between 500° and 900°C and other foamed silicate containing products of synthetic origin, said particles being spherically shaped with a diameter of 0.1 to 10 mm and having a bulk density of 0.3 to 0.25.

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## 3,895,980
## COATED LEAD AZIDE COMPOSITIONS SENSITIVE TO FLAMES BUT INSENSITIVE TO FRICTION

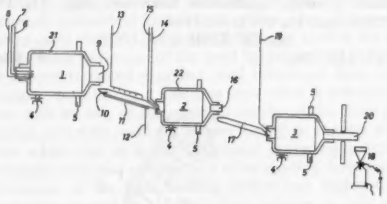
**Nicolas Makay, Rio de Janeiro, Brazil, assignor to F. G. Kretschmer & Co., Vaduz, Liechtenstein**

**Continuation of Ser. No. 240,962, April 4, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,573**

**Claims priority, application Germany, Apr. 4, 1972, 2120916**

**Int. Cl. C06c** *1/02*

**U.S. Cl. 149—8** **6 Claims**



1. A lead azide composition comprising uniformly sized lead azide particles covered uniformly with lead trinitroresorcinate.

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## 3,895,981
## TEXTILE BOTTOM FLOOR COVER HAVING AT LEAST ONE REINFORCING STRIP AND METHOD OF PRODUCTION THEREOF

**Guenter Horst Tesch, Schoenberg, Switzerland, assignor to Breveteam S.A., Fribourg, Switzerland**

**Continuation-in-part of Ser. No. 705,664, Feb. 15, 1968, abandoned. This application Sept. 29, 1972, Ser. No. 293,566**

**Claims priority, application Switzerland, Feb. 20, 1967, 2614/67**

**Int. Cl. E04f** *11/16;* **B32b** *7/14;* **D03d** *27/00*

**U.S. Cl. 156—71** **5 Claims**

1. A method of laying a floor covering upon the stairs of a staircase, comprising the steps of:

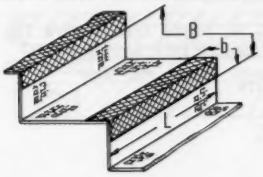
a. forming a continuous textile web having a base and an exposed face;

b. depositing in a flowable state on said face along a longitudinally edge thereof a thermally softenable strip of synthetic-resin material and permitting same to harden to a non-tacky solid state at room temperature;

c. coating the underside of said base with adhesive having increased bonding strength upon heating;

d. cutting said web into individual lengths equal to the transverse width of the stairs of said staircase;

e. thermally softening said strip and simultaneously thermally activating said adhesive and bending the strip of each of said length around an edge of the respective stair while applying the respective adhesive as activated upon the thermal softening of the respective strip against a stair surface to bond the individual length to the respective stair.




2. A floor-covering material for individual stairs of a staircase consisting of a continuous length of a textile web having a base and an exposed face; a strip of thermally softenable synthetic-resin material deposited along a longitudinal edge of said web and bonded to said face, said strip being in a solid non-tacky state at room temperature; and an adhesive coated onto the underside of said base at least in the region of said strip and thermally activatable concurrently with said thermal softening of said strip to increase the adhesive bond of said covering to surfaces of a stair upon the softening of said strip to conform to a stair edge.

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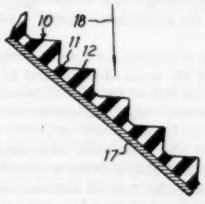
## 3,895,982
## WEAR PROTECTION ELEMENTS FOR PLANAR OR CURVED SURFACES EXPOSED TO ABRASION

**Bo Klas Gerhard Persson, Trelleborg, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden**

**Continuation-in-part of Ser. No. 98,295, Dec. 15, 1970, abandoned. This application Nov. 22, 1972, Ser. No. 308,858**

**Int. Cl. B32b** *31/00*

**U.S. Cl. 156—71** **7 Claims**




1. The method of preparing a durable elastomeric surface for receiving abrasive material falling thereon having wear resistance enhanced by control of the angle of impact of said material thereon, which surface has lower wear resistance than conventional hardened materials for a range of angles between grazing and perpendicular impact, comprising the steps of observing for a particular material flow and surface motion in an installation a characteristic angle of impact of a predominant portion of said material upon said surface generally, selecting a set of wear resistant resilient elements having like forward and after faces meeting asymmetrically a ridged vertex, the respective forward and after faces making differing angles to the perpendicular to said surface, securing to said surface said elements in mutually parallel relation oriented transversely to the linear motion of the surface when moving.

and to the direction of impact of material when fixedly inclined, to effect relative motion between the elements arranged on said surface and motion of said material falling thereon to cause said characteristic angle to lie substantially within 20 degrees of said perpendicular to said forward faces.

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3,895,983

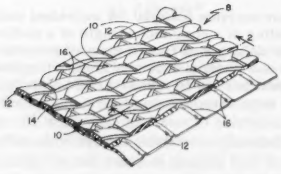
## PROCESS OF FABRICATING A PLASTIC NET LAMINATE MATERIAL

Theo O. Lang, Leominster, and Thomas A. Lane, E. Pepperell, both of Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

Division of Ser. No. 29,596, April 17, 1970. This application Aug. 23, 1973, Ser. No. 390,817

Int. Cl.[2] B32B *31/20*

U.S. Cl. 156—79 10 Claims



1. A process for the fabrication of a laminated material including an expanded plastic foam net layer and a layer of continuous sheet material bonded thereto comprising:

a. forming a layer of expandable plastic net including net strands and intersections thereof composed of expandable plastic material;

b. applying heat to said plastic net layer in at least two separate operations to cause a first stage and second stage expansion of the expandable plastic material in said net layer;

c. joining a layer of continuous sheet material to said plastic net layer after the application of heat to cause said first stage expansion but before the application of heat to cause said second stage expansion of the expandable plastics material in said plastic net layer.

2. A process for the fabrication of a laminated material including an expanded plastic foam net layer and a layer of continuous sheet material bonded thereto comprising:

a. forming a layer of expandable plastic net including net strands and intersections thereof composed of expandable plastic material;

b. applying heat to said plastic net layer in at least two separate operations to cause a first stage and second stage expansion of the expandable plastic material in said net layer;

c. joining a layer of continuous sheet material to said plastic net layer before the application of heat to cause said second stage expansion of the expandable plastic material in said plastic net layer.

d. after the joining of the layer of continuous sheet material layer to said expandable plastic net layer, compressing said laminate material in zones along spaced parallel lines on at least one side thereof to improve the bendability of said material and to aid in the joining of the layers of the laminate material.

3,895,984

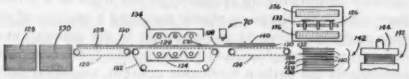
## PLYWOOD MANUFACTURE USING FOAMED GLUES

Charles N. Cone, Portland, and Julius M. Steinberg, Hillsboro, both of Oreg., assignors to Pacific Adhesives Company, Hillsboro, Oreg.

Continuation-in-part of Ser. No. 80,961, Oct. 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 839,481, July 7, 1969, abandoned. This application Oct. 12, 1973, Ser. No. 405,752

Int. Cl. B32b *5/18*

U.S. Cl. 156—79 18 Claims



9. The method of making plywood which comprises:

a. continuously propelling an unfoamed liquid plywood glue at a predetermined flow rate,

b. continuously foaming the liquid glue as it is propelled,

c. continuously applying the foamed glue to the surfaces of a succession of wood veneers,

d. laying up the veneers into a plywood assembly,

e. and pressing the assembly to form a plywood panel, thereby breaking the foam and forming substantially unfoamed glue bonds between the veneers.

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3,895,985

## METHOD OF REPAIRING TIRES AND SHELLS USED FOR THIS METHOD

Wilhelm Schelkmann, Crengeldanzstr. 85a, D 581 Witten, Germany

Filed Apr. 10, 1973, Ser. No. 349,787

Claims priority, application Germany, Apr. 11, 1972, 2217293; Apr. 11, 1972, 2217244

Int. Cl.[2] B29H *5/04, 17/36*

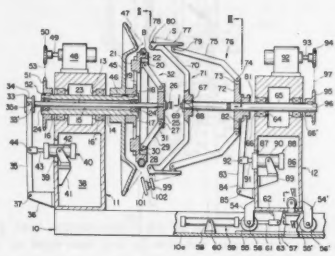
U.S. Cl. 156—96 17 Claims

1. A method of repairing tires, comprising the steps of forming an assembly from a tire having a U-shaped cross-section and a tread strip on the peripheral surface of the tire with a layer of binder material sandwiched between the tire surface and the tread strip; forming a pair of shape-retaining annular shells and applying said shells against the sidewalls of the tires; forming a fluid-tight seal at the inner edge of each annular shell; forming a fluid-tight seal at the outer annular edge of each shell in engagement with at least a lateral portion of the tread strip so as to form an enclosure at least partly enclosing said assembly; evacuating air from beneath said enclosures so as to cause the sidewalls of the tires to approach the corresponding shells; and treating the partly enclosed assembly with heat to permanently bond the tread strip to said tire, whereby said shape-retaining shells prevent the tire from deforming due to the presence of heat.

## 3,895,986
## APPARATUS FOR AND METHOD OF APPLYING A STRIP OF ELASTIC MATERIAL TO A TIRE BEAD

**Tasaaki Komatsu, and Shinichi Arai, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan**

**Filed Sept. 20, 1974, Ser. No. 507,983**
**Claims priority, application Japan, Sept. 21, 1973, 48-106582**
**Int. Cl.[2] B29H** *17/32*
**U.S. Cl. 156—136** **18 Claims**



1. An apparatus for applying an annular strip of elastic material to an outer peripheral edge of a continuous loop of bead to be incorporated into an automobile tire, comprising bead holding means having a generally circular outer perimeter which has a variable diameter and around which said bead is to be lapped in a generally circular form, strip transfer means including a number of support members which are positioned in a substantially coaxial relationship to said bead holding means and which are movable between first angular positions operable to carry the strip of elastic material in a generally cylindrical form and second angular positions operable to carry the strip in a generally annular form in the vicinity of the outer perimeter of the bead holding means conditioned to a predetermined diameter, said cylindrical form and said annular form having a common axis which is substantially in line with an axis of the outer perimeter of the bead holding means, and strip receiving means having an annular wall portion which has an inner peripheral extending substantially coaxially with and radially at a close spacing from said outer perimeter of the bead holding means and angled to be in proximity to and in a face-to-face relation to said support members in said second angular positions thereof for releasably receiving thereon the strip of the generally annular form from said support members with an inner peripheral edge of the strip in close contact with the outer peripheral edge of the bead on said bead holding means.

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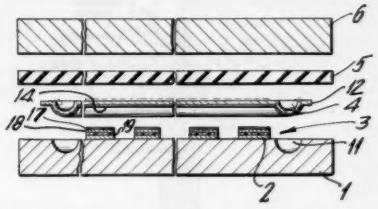
## 3,895,987
## IDENTIFICATION PLATE AND METHOD FOR ITS MANUFACTURE

**Walter Loreck, Wattens, Austria, assignor to D. Swarovski & Co., Austria**

**Filed Aug. 3, 1972, Ser. No. 277,833**
**Claims priority, application Austria, Aug. 4, 1971, 6826/71**
**Int. Cl. B32b** *31/12*
**U.S. Cl. 156—223** **6 Claims**

1. A method for producing an identification plate assembly, such as a motor vehicle license plate, utilizing a blank plate upon which indicia is applied, said method comprising the steps of providing a pair of pressure members between which said assembly may be formed by application of a compressive force thereto, positioning upon one of said pressure members at least one templet member consisting of rigid material and being shaped in the form of said indicia to be produced upon said identification plate assembly, applying over said templet member indicia sheet material having a first side adapted to be viewed during use of said identification plate assembly and a second side opposite said first side, said indicia sheet material having a configuration conforming to the shape of said templet and being applied thereon with said first side against said templet, applying said blank plate over said templet and indicia sheet with said second side of said indicia sheet in contact



with said blank plate, applying a resilient pressure sheet over said blank plate and compressing the assembly thus formed between said pair of pressure members to simultaneously cause said blank plate to be indented in the form of said templet members while said indicia sheet material is adhered to said blank plate along said indentations.

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## 3,895,988
## METHOD OF MAKING INLAID RESINS

**Everett R. Miller, Dennisport, Mass., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Division of Ser. No. 146,266, May 24, 1971, Pat. No. 3,752,690. This application May 25, 1973, Ser. No. 364,215**
**Int. Cl. B44c** *1/20*
**U.S. Cl. 156—245** **3 Claims**

1. In a method of producing a continuous sheet of moldable fiber reinforced resinous compound having a decorative inlay, the steps of:

a. passing a carrier sheet having a memory over a first surface having a depression therein,
b. causing said carrier sheet material to be moved down into said depression taking the form thereof,
c. depositing a resinous material into the resulting carrier sheet depression,
d. causing said carrier sheet to return to a generally flat condition leaving a raised area of resinous material thereon,
e. depositing a second layer of resinous material atop said carrier sheet such that said second layer is flowed around and over said raised area of resinous material producing a continuous sheet of resinous material in which said raised area becomes an inlay,
f. applying fiberous reinforcement over the top of said sheet of resinous material,
g. applying a second carrier sheet having a coating of resinous material thereon over said fiberous reinforcement to produce a continuous sheet of fiber reinforced moldable compound between said two carrier sheets.

3,895,989

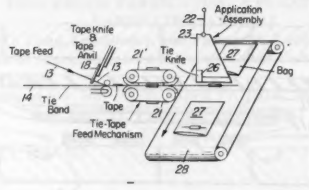
## METHOD FOR TIE-BAND APPLICATION

Paul Adrian Lucas, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 225,131, Feb. 10, 1972, Pat. No. 3,794,545. This application May 4, 1973, Ser. No. 357,283

Int. Cl. B32b 31/00

U.S. Cl. 156—265 1 Claim




1. A method for applying a detachable closure onto the exterior wall surface of a bag which comprises (a) bringing a continuous length of closure wire into contact with a length of pressure-sensitive adhesive coated tape; (b) adhesively laminating said length of tape to said continuous wire; (c) subsequently severing a length of said wire to form an individual closure assembly comprising said severed wire and tape length adhered thereto; and (d) subsequently applying said closure assembly to said exterior bag wall surface whereby said closure wire is adhesively affixed to said bag wall.

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3,895,990

## PROCESS FOR JOINING STRIPS OF BELT ALONG THEIR LENGTHWISE RUNNING SIDE EDGES

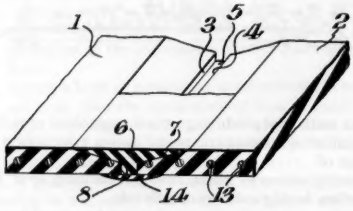
Heinz Josteit, Frechen-Bachem, Germany, assignor to Rheinische Braunkohlenwerke AG, Cologne, Germany

Filed July 27, 1972, Ser. No. 275,755

Claims priority, application Germany, July 30, 1971, 2138132

Int. Cl. C09j 5/10

U.S. Cl. 156—304 11 Claims



1. A process for joining belt strips together along their lengthwise running side edges wherein the side edges of the belt strips are slightly spaced apart and beveled to provide an intermediate area having a double tapered outer section and a stub-shaped root section, the intermediate area situated between these side edges being filled and sealed by inserted material having elastic rubber properties characterized in that between the side edges to be connected together there is arranged a profiled fillet strip, the profiled fillet strip comprising a double tapered outer section and a stub-shaped root section substantially corresponding to the intermediate area between the side edges of the joined belt strips, the profiled fillet strip being sealed with the side edges of the joined belt strips by being bonded thereto and the outer surface of the joined belt strips and profiled fillet strip being substantially even and smooth.

3,895,991

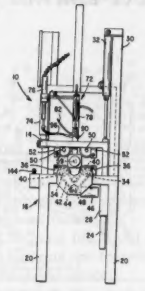
## MACHINE FOR JOINING A THERMOPLASTIC CAP TO A THERMOPLASTIC TUBE

Gene A. Brothers, Gering, Nebr., assignor to Eltra Corporation, Toledo, Ohio

Filed June 6, 1974, Ser. No. 477,110

Int. Cl.[2] B29C 27/10

U.S. Cl. 156—457 3 Claims



1. A machine for joining a thermoplastic cap to a thermoplastic cylindrical tube comprising a main frame, a top frame carried by said main frame and movable relative thereto, first roller means mounted on said main frame, second roller means mounted on said top frame, said top frame means being movable by its weight so that a tube supported between said roller means will be restrained and straightened, stop means carried by said roller means, biasing means carried by said main frame, said roller, stop and biasing means cooperating to support a tube for rotation about its longitudinal axis and to hold a cap in abutment with one end of the tube, an assembly carried by said top frame for supplying thermoplastic fillet material to the junction of the tube and cap, pressing the fillet material against the junction and locally heating the cap, tube and fillet material in the area where the fillet material is pressed against the junction to a temperature at which the cap, tube and fillet material soften sufficiently to bond to each other, and means connected to one of said roller means for driving said one roller means and causing the tube supported by said roller means to rotate about its longitudinal axis so that a continuous circumferential fillet joint is formed between the cap and tube.

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3,895,992

## APPARATUS FOR MANUFACTURING FOAMED PLASTIC

Kimikazu Azuma, No. 3-18 Matsugaoka 3-chome Kugenuma, Fujisawa-shi, Kanagawa-ken, Japan

Division of Ser. No. 129,455, March 30, 1971, Pat. No. 3,758,459. This application Apr. 13, 1973, Ser. No. 350,766

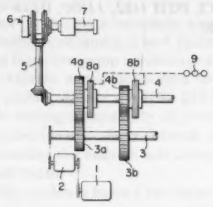
Claims priority, application Japan, Apr. 2, 1970, 45-28086; Apr. 2, 1970, 45-28087

Int. Cl. B29d 23/04

U.S. Cl. 156—500 2 Claims

1. An apparatus for use in manufacturing a foamed plastic tubular net, comprising a motor, a first shaft driven by and drivingly interconnected to said motor, a second shaft driven by and drivingly interconnected to said first shaft, first means drivingly connectible between said first and second shafts for permitting driving of said second shaft from said first shaft, said first means including a low speed driving gear provided on said first shaft and a low speed driven gear provided on said second shaft, said first means further including first electromagnetic clutch means associated with said low speed driven gear for selectively clutching same to said second shaft, second means drivingly connectible between said first and second shafts for permitting driving of said second shaft from said first

shaft, said second means including a high-speed driving gear provided on said first shaft and a high-speed driven gear provided on said second shaft, said second means further including second electromagnetic clutch means associated with said high speed driven gear for selectively clutching same to said second shaft, timer means coupled to said first and second electromagnetic clutch means for causing said first and second clutch means to be alternately and sequentially energized for




causing said second shaft to be alternately and sequentially rotated at high and low speeds for predetermined time periods, a variable speed gear mechanism drivingly connected in series between the high-speed driving gear and the high-speed driven gear, die means for extruding a tubular net, said die means being connected to and rotatably driven by said second shaft and being rotatable in a direction transverse to the direction of extrusion of the net, and extruder means connected with said die means for extruding said tubular net therefrom.

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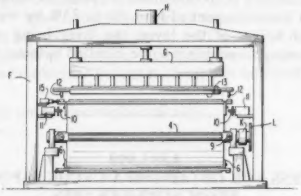
**3,895,993**

## ROTARY AUTOMATIC WELDER

**Masao Mikami, No. 9-19, Kougominami 1-chome, Hiroshima-shi, Hiroshima, Japan**

**Filed July 25, 1974, Ser. No. 491,899**
**Int. Cl. B32b *31/00*; B02c *11/08***
**U.S. Cl. 156—582** **5 Claims**



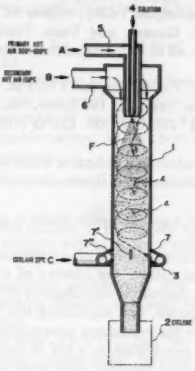
**1.** A rotary automatic welder comprising:
a fixed welder frame,
a fusion welding bar vertically movable on said fixed frame, means for moving said bar vertically,
a center shaft mounted beneath said fusion welding bar for rotation about a horizontal axis,
a roller, supporting pieces of thermoplastic cloth thereon and being fixed to said shaft and rotatable therewith, about the shaft axis,
a plurality of fusion welding beds fixed to said roller, extending the length of said roller, parallel to each other, and at spaced circumferential positions about the periphery of said roller, and receiving said clothpieces,
means for rotating said shaft and said roller, and
means for locking said roller at positions such that a given fusion welding bed may be fixed with respect to said overlying vertical movable bar and in alignment therewith to permit fusion welding of the pieces of thermoplastic cloth carried by said fusion welding bed.

**3,895,994**

## SPRAY DRYER

**Kenji Saguchi, 4-15 Yamanone 1-chome, Zushi, Kanagawa Prefecture, and Takashi Hiraiwa, 129 Sasanodai, Yokohama, Kanagawa Prefecture, both of Japan**

**Filed Feb. 15, 1974, Ser. No. 442,872**
**Int. Cl.² B01D *1/16***
**U.S. Cl. 159—4 B** **3 Claims**




**1.** A spray dryer comprising: a hollow cylinder forming a drying chamber having a first inlet end and a second outlet end, a liquid supply tube having a discharge end disposed axially within said inlet end of said chamber, a first primary hot air supply tube concentrically disposed with respect to said liquid supply tube, and terminating in a common transversely plane therewith, a second hot air supply tube connected with said inlet end of said cylinder to provide a cylindrical column of air completely surrounding said first hot air supply tube in the area of said common plane, a third air supply tube having means for communicating with the interior of said outlet end of said chamber and introducing at least one spiral air current moving tangentially with respect to the inner surface of said cylinder and in a longitudinal direction toward said inlet end; whereby said spiral air current forms a moving curtain preventing hot dry particles outwardly penetrating said cylindrical column of air from adhering to the inner surface of said cylinder, said spiral air current mixing with said cylindrical column of hot air along the axis of said cylinder to lower the effective temperature thereof at the outlet end of said cylinder.

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**3,895,995**

## FILM DRYING OF HYDRATED ALKALI METAL SILICATE SOLUTIONS

**Robert W. Spencer, Wallingford, and Newton W. McCready, Newtown Square, both of Pa., assignors to Philadelphia Quartz Company, Valley Forge, Pa.**

**Filed Jan. 18, 1971, Ser. No. 107,446**
**Int. Cl. B01d *1/22***
**U.S. Cl. 159—49** **3 Claims**

**1.** In the known process of drying an alkali metal silicate solution, including casting a thin film and drying with heat to obtain amorphous particles, the improvement to said process including the control of process conditions by:
a. maintaining the surface upon which said film is cast at a temperature between 95° C and 136° C and below the boiling point of the alkali metal silicate solution,
b. maintaining the air surrounding said film during the drying at 25 to 35% relative humidity, and
c. maintaining the thickness of said film to be dried between 0.5 and 5.0 millimeters; whereby the product obtained

from said process will be equilibrated with respect to the moisture content, said moisture content being 10 to 30% by weight, and have a bulk density of 20 to 70 lbs./cu.ft., and the product has an $SiO_2/M_2O$ mole ratio of 1.5 to 5.0/1.0.

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3,895,996

## BENEFICIATION OF LIGNIN SOLUTIONS AND PULP MILL WASTES

**K. Robert Lange, Huntington Valley; Arthur M. Stern, Morrisville; Lawrence L. Gasner, and Yuan Tsun Hsu, both of Cornwells Heights, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.**

**Division of Ser. No. 277,006, Aug. 1, 1972, Pat. No. 3,829,252. This application June 22, 1973, Ser. No. 372,889**

**Int. Cl.² D21C *11/00*; C07G *1/00***

**U.S. Cl. 162—16** **10 Claims**

1. A method of producing a utilizable water-soluble product from an aqueous solution of a lignin derivative which comprises

i. insuring that the aqueous lignin waste is at a pH of from about 8.5 to 13;

ii. adding a sufficient quantity of a water-soluble salt of a polyvalent metal cation, the cations of which will react with said lignin derivative and thereby produce a water-insoluble precipitate, and separating the water-insoluble precipitate from the remaining supernatant solution;

iii. acidifying the precipitate to a pH of from about 0 to 3 with a mineral acid solution; and allowing the resulting medium to digest for from about 1 minute to about 48 hours; and

iv. contacting said precipitate with an aqueous alkaline solution of an alkali metal or ammonium compound in an amount sufficient to produce a solution having a pH of from about 9 to 13 and thereby solubilize precipitate.

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3,895,997

## PRODUCTION OF SHAPED ARTICLES FROM PAPER SLUDGE

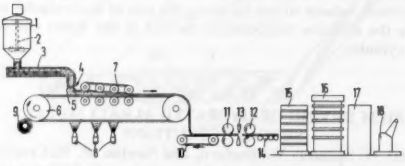
**George Robert Haywood, Tideswell, near Buxton, England, assignor to National Research Development Corporation, London, England**

**Filed July 19, 1972, Ser. No. 273,279**

**Claims priority, application United Kingdom, July 21, 1971, 34243/71; Feb. 8, 1972, 5817/72**

**Int. Cl. D21h *1/00*; D21f *1/82*, *11/00***

**U.S. Cl. 162—100** **38 Claims**



1. A process for the production of a shaped article from paper sludge which comprises depositing a layer of an aqueous slurry of said sludge, controlling the water content of the layer by applied pressure and drying so as to produce a coherent agglomerated layer having a degree of wet strength and a water content of from about 15 to 30% by weight based on the total weight of the layer and then forming the layer under pressure with drying to produce a shaped article.

30. A pressure-formable coherent agglomerated layer of paper sludge having a thickness greater than one-sixteenth of an inch, a density of from 0.8 to 2.0 grams per cubic centimeter and a water content of from 15 to 30% by weight based on the total weight of the layer, the layer being sufficiently self-supporting to enable it to be handled without disintegration.

3,895,998

## PRODUCTION OF SHAPED ARTICLES FROM PAPER SLUDGE

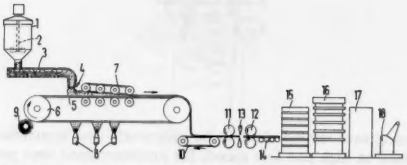
**George Robert Haywood, Tideswell, near Buxton, and Alan David Plumstead, London, both of England, assignors to National Research Development Corporation, London, England**

**Filed July 19, 1972, Ser. No. 273,280**

**Claims priority, application United Kingdom, Feb. 8, 1972, 5817/72**

**Int. Cl. D21f *1/82*, *11/00*; D21h *1/00***

**U.S. Cl. 162—100** **38 Claims**



1. A process for the production of a shaped article from paper sludge which comprises depositing a layer of an aqueous slurry of said sludge, controlling the water content of the slurry by applied pressure so as to produce a coherent agglomerated layer having a degree of wet strength and a water content of from 40 to 85% by weight based on the total weight of the layer and then forming the layer under pressure with drying to produce a shaped article.

30. A pressure-formable coherent agglomerated layer of paper sludge having a thickness greater than one-sixteenth of an inch, a density of from 0.8 to 2.0 grams per cubic centimeter, and a water content of from 40 to 85% by weight based on a total weight of the layer, the layer being sufficiently self-supporting to enable it to be handled without disintegration.

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3,895,999

## PROCESS FOR OBTAINING A CRUDE SAPOGENIN FROM AGAVE LEAVES

**Bjarte Loken, Milan, Italy, assignor to Omni Research Incorporated, San German, P.R.**

**Filed Jan. 22, 1974, Ser. No. 435,464**

**Int. Cl.² C12B *1/00***

**U.S. Cl. 195—7** **7 Claims**

1. A process for recovering a crude sapogenin containing product from agave leaves, which comprises:

squeezing a virgin juice from agave leaves prior to any decortication thereof, the virgin juice being expressed in amount of from about 10–40 percent by weight of the leaves;

thereafter concentrating the saponin steroid values present in the virgin juice;

then acid hydrolyzing the steroid value containing concentrate to thereby convert saponin steroid values into a water insoluble sapogenin containing solids hydrolyzate product;

and recovering said water insoluble sapogenin containing hydrolyzate product from the aqueous portion of the hydrolyzate.

## 3,896,000
## HALOPHILIC NUCLEASE AND A PROCESS FOR PRODUCING THE SAME

**Masahiro Kamekura, Urawa, and Hiroshi Onishi, Noda, both of Japan, assignors to Noda Institute for Scientific Research, Noda, Japan**

**Filed Oct. 16, 1973, Ser. No. 406,798**

**Claims priority, application Japan, Oct. 18, 1972, 47-103600; Aug. 20, 1973, 48-92390**

**Int. Cl.[2] C12D** *13/10*

**U.S. Cl. 195—62** **11 Claims**

**1.** A process for producing a halophilic nuclease comprising culturing in a medium containing 1 to 4 moles/l of at least one member selected from the group consisting of sodium chloride and potassium chloride a microorganism strain *Micrococcus varians var. halophilus var nov.* (ATCC 21971, FERM-P No. 1648) said strain having a capability of producing halophilic nuclease in the presence of sodium chloride and/or potassium chloride to accumulate the enzyme and collecting the enzyme from the cultured broth.

**11.** A halophilic nuclease having the following characteristics:

1. having a capability of releasing nucleotides by cleaving the nucleotide-chain at the terminal of native or heat-denatured deoxyribonucleic acid (DNA) or ribonucleic acid (RNA),
2. decomposing calf thymus DNA and RNA of yeasts,
3. being unable to decompose di-p-nitrophenyl phosphate which is decomposed by phosphodiesterase,
4. showing a stronger activity against heat-denatured DNA as compared with DNA,
5. being three times active against RNA than DNA,
6. the optimum pH thereof is around 8.0 and the stable pH range is 5 – 12 and being inactivated slightly at pH 4.0,
7. the optimum temperature for enzymatic reaction is at a temperature of 40° – 45°C while it is inactivated to a considerable extent at 40°C and it is inactivated completely at 50°C,
8. being inactivated quickly when dialyzed against water, 0.05 mole/l of sodium chloride-containing 0.01 mole/l tris-buffer solution (pH 8.0),
9. showing a strong enzymatic activity in a 1 – 3 mole/l of sodium chloride-containing aqueous solution,
10. being activated by 0.1 mole/l of $Mg^{++}$ ion or 0.01 mole/l of $Mn^{++}$ ion-containing aqueous solution,
11. being inactivated completely 0.01 mole/l of $Zn^{++}$ ion or 0.01 mole/l of $Cu^{++}$ ion-containing aqueous solution,
12. whose molecular weight is about one hundred thousand and
13. being single electrophoretically.

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## 3,896,001
## MALTING PROCESSES

**James Barrett, Tonbridge; Brian Heys Kirsop, Redhill, and Godfrey Henry Oliver Palmer, Copthorne, all of England, assignors to Brewing Patents Limited, London, England**

**Filed Nov. 17, 1972, Ser. No. 307,631**

**Claims priority, application United Kingdom, Nov. 29, 1971, 55410/71**

**Int. Cl. C12c** *1/02*

**U.S. Cl. 195—71** **5 Claims**

**1.** A process for the production of malt comprising removing at least a part of the husk of the barley in such manner as to perforate the pericarp and testa to render the aleurone layer of the barley accessible to externally applied gibberellic acid, steeping the barley in an aqueous medium, resting the steeped barley in air, resteeping the barley in an aqueous medium, treating the barley with an aqueous mineral acid of a strength in the range of 0.003N –0.5N during or at the end of the resteeping step, applying at least 0.1 p.p.m. gibberellic acid, based on the barley weight, to said barley at or before completion of the resteeping operation, allowing the resteeped barley to germinate for a period of 35–45 hours and then terminating germination before visible growth of microorganisms has taken place.

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## 3,896,002
## PRODUCTION OF BREFELDIN-A

**Colin C. Howard, Downham Market; Robert A. W. Johnstone, Bebington, and Ian D. Entwistle, Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.**

**Filed May 14, 1973, Ser. No. 359,937**

**Claims priority, application United Kingdom, May 22, 1972, 23949/72**

**Int. Cl. C12d** *9/00*

**U.S. Cl. 195—81** **4 Claims**

**1.** A process for the production of Brefeldin-A which comprises cultivating a fungus of the species *Phyllosticta medicaginis* in the presence of an aqueous medium containing a source of assimilable carbon, and recovering Brefeldin-A from the cultivated mixture.

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## 3,896,003
## PROCESS AND MEDIUM FOR THE CULTIVATION OF MICROORGANISMS TO ACHIEVE OPTIMUM GROWTH AND YIELD

**Nils Torsten Ingestad, Jakobsberg, and Nils Ludvig Molin, Sollentuna, both of Sweden, assignors to AB Marabou, Sundyberg, Sweden**

**Filed Mar. 19, 1973, Ser. No. 342,742**

**Claims priority, application Sweden, Mar. 20, 1972, 3535/72**

**Int. Cl. C12k** *1/10*

**U.S. Cl. 195—100** **3 Claims**

**1.** A microbiological mineral nutrient medium for cultivating the microorganism *Methylomonas methanolica*, NRRL B-5458, to obtain maximal production of cell mass and maximal utilization of the medium, which comprises, in addition to carbon, the nutrient elements nitrogen (N), phosphorus (P), potassium (K), sulfur (S), calcium (Ca), magnesium (Mg), and iron (Fe), in weight proportions within the following ranges: 100 nitrogen; 22.5–27.5 phosphorus; 2.25–2.75 potassium; 8.1–9.9 sulfur; 1.35–1.65 calcium; 1.3–2.2 magnesium; and 2.25–2.75 iron.

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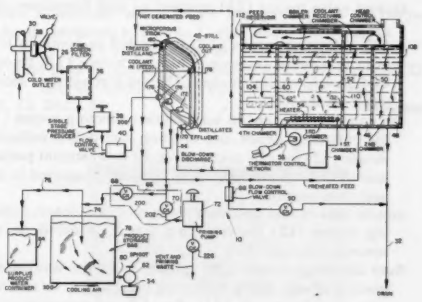
## 3,896,004
## DISTILLATION SYSTEM UTILIZING A MICROPOROUS STACK

**Franklin A. Rodgers, Brookline, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 22, 1972, Ser. No. 317,623**

**Int. Cl. B01d** *3/00, 3/42, 3/08, 3/10*

**U.S. Cl. 202—167** **13 Claims**

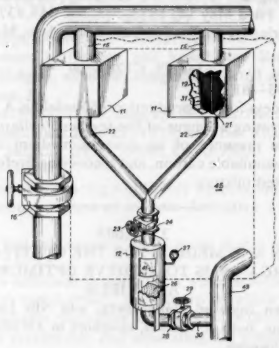


**2.** The invention in accordance with claim **1**, wherein said priming means comprises a pump and further including means for venting said priming means.

## 3,896,005
## FILTERING AND DEBRIS REMOVING APPARATUS FOR CLEANING A SEA WATER STREAM

Hector M. Zuccolotto, Malintzin 44, Coyoacan, Mexico

Filed Sept. 13, 1973, Ser. No. 396,745
Int. Cl.[2] B01D 3/00
U.S. Cl. 202—185 4 Claims



1. A filtering and debris removing apparatus for cleaning a coolant liquid stream comprising:

a liquid evaporator which comprises a vacuum chamber means, (45), and a condenser including a tube bundle means (17) within said vacuum chamber means (45);

at least two debris removing chamber means (11) coupled to said condenser;

strainer means (19) within each of said debris removing chamber means (11) and having ends extending between a pair of opposing walls thereof for dividing each of said debris removing chamber means (11) into a respective upstream compartment and a downstream compartment; debris containing coolant liquid entrance means (34, 15, 16) discharging into said respective upstream comopartments of said debris removing chamber means (11) and adjacent an end of said strainer means (19);

first valve means (16) in said debris containing coolant liquid entrance means (34, 15, 16);

coolant liquid outlet means sidewardly leading from said respective downstream compartments of saidi debris removing chamber means (11) to the inlet of said tube bundle means (17) of said condenser;

blowdown pipe means (22) leading from said respective upstream compartments and adjacent the other ends of said strainer means (19);

second valve means (23) coupled to said blowdown pipe means (22);

debris collecting means (12) connected in common to at least two debris removing chamber means (11) through said blowdown pipe means (22) and through said second valve means (23);

screening means (26) in said debris collecting means (12) for collecting debris and dividing said debris collecting means (12) into an upstream and a downstream portion, said blowdown pipe means (22) being connected to said upstream portion;

means (40) in said upstream portion of said debris collecting means (12) for removing debris collected on said screening means (26);

fluid discharge means (28) leading from the downstream portion of said debris collecting means (12) to said vacuum chamber means (45) of said liquid evaporator; and third valve means (29) in said fluid discharge means (28);

whereby with said first valve means (16) open and in said second (23) ang third (29) valve means closed said debris containing coolant liquid is filtered by flow thereof through said debris containing coolant liquid entrance means, first valve means (16), upstream compartment, strainer means (19), downstream compartment, coolant liquid outlet means and into said tube bundle means (17), while at the same time maintaining said debris collecting means (12) isolated from said debris removal chamber means (11) and said vacuum chamber means (45) to provide for the disposal of the debris previously collected thereby;

whereby with said first valve means (16) closed and said second (23) and third (29) valve means open the previously filtered liquid in said tube bundle means (17) acts as a source of backwash fluid for backwashing said strainer means (19) by flow of said filtered coolant liquid from said tube bundle means (17) through said coolant liquid outlet means, downstream compartment, strainer means (19), upstream compartment, blowdown pipe means (22), second valve means (23), debris collecting means (12), fluid discharge means (28), third valve means (29) and into said vacuum chamber means (45); and

whereby with said first (16), second (23) and third (29) valve means open a scrubbing action is effected over the entire upstream filtering surface of said strainer means (19) by violent flow of debris containing coolant liquid from siad debris containing coolant liquid entrance means (34, 15, 16) through said first valve means (16), upstream compartment fully scrubbing the upstream surface of said strainer means (19), blowdown pipe means (22), second valve means (23), debris collecting means (12), fluid discharge means (28), third valve means (29), and into siad vacuum chamber means (45), with part of said coolant liquid being simultaneously filtered through said strainer means (19) to pass through said downstream compartment and said coolant liquid outlet means into said tube bundle means (17) in order to permit substantially continuous operation of said condenser.

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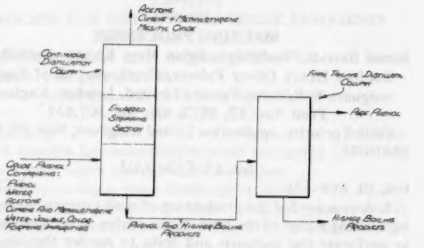
## 3,896,006
## MESITYL OXIDE REMOVAL FROM HIGH-PURITY PHENOL

Maurice Dudley Cooke, East Horsley, England, assignor to BP Chemicals International Limited, London, England

Continuation-in-part of Ser. No. 360,975, May 16, 1973, abandoned. This application May 8, 1974, Ser. No. 468,147
Claims priority, application United Kingdom, June 1, 1972, 25598/72
Int. Cl. B01d 3/34
U.S. Cl. 203—28 14 Claims



1. A process for the purification of crude phenol obtained from the acid cleavage of cumene hydroperoxide which comprises subjecting a feed of crude phenol consisting essentially of phenol and less than 1,000 parts per million of water-soluble color-forming impurities boiling from 152° to 182°C. to a fractional distillation such that the water-soluble color-forming impurities are retained within a section of the column under distillation conditions so as to concentrate said impuri-

ties and at least partially to decompose said impurities to mesityl oxide, removing a base product comprising phenol free from water-soluble color-forming impurities boiling from 152° to 182°C. and an overhead fraction containing mesityl oxide, and thereafter distilling the phenol from the higher-boiling decomposition products.

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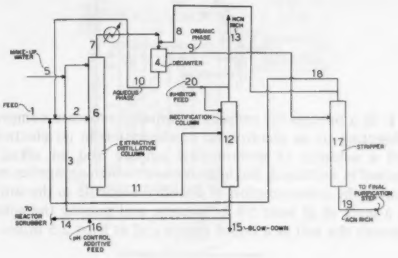
**3,896,007**

**pH CONTROL OF RECYCLE WATER IN THE PLURAL STAGE DISTILLATION OF A CRUDE ACRYLONITRILE FEED**

**Carlo Rescalli; Pierluigi Rebora, and Alessandro Ginnasi, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy**

**Filed Nov. 10, 1972, Ser. No. 305,227**
**Claims priority, application Italy, Nov. 17, 1971, 31195/71**
**Int. Cl. B01d** *3/34*
**U.S. Cl. 203—33** **4 Claims**




1. In a cyclic process for removing impurities from a synthesized acrylonitrile mixture wherein said mixture is extractively distilled with water, the overhead stream containing raw acrylonitrile and the bottom stream containing substantially all of said impurities, the improvement which comprises the steps of:

a. subjecting a mixture containing acrylonitrile and impurities selected from the group consisting of HCN, $CH_3CN$, carbonyl compounds, benzene, propionitrile, allyl alcohol and mixtures thereof to an extractive distillation step using water as the extracting solvent and collecting an overhead stream comprising predominately raw acrylonitrile and a bottom stream comprising the impurities recited above;

b. subjecting said bottom stream from the extractive distillation to a distillation step whereby predominately HCN, $CH_3CN$ and carbonyl compounds are discharged overhead; and removing as a bottom stream all the water necessary for absorbing acrylonitrile from the reaction gases and as the extractive solvent for the extractive distillation column, introducing an additive compound to the water necessary for absorbing acrylonitrile for maintaining the pH in this water and separately adding make-up water to the recycled extractive solvent;

c. separating said overhead stream from the extractive distillation comprising predominately raw acrylonitrile into an aqueous phase which is recycled to said extractive distillation step and an organic phase comprising raw acrylonitrile which is conveyed to stripping step (d);

d. stripping the raw acrylonitrile from step (c) into an overhead phase comprising a gaseous water component which is condensed and recycled to said extractive distillation step and an HCN-containing aqueous component which is recycled to separation step (c), and a bottom organic phase comprising substantially pure acrylonitrile;

whereby the contents of the extractive column and rectification column are maintained at a pH in the range 5.5 to 7.5 by the incorporation of additives.

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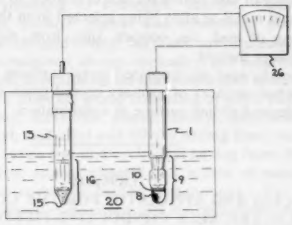
**3,896,008**

**ELECTROCHEMICAL POTENTIOMETRIC METHOD FOR SELECTIVELY DETERMINING ALKALINE PHOSPHATASE CONTENT IN AQUEOUS FLUIDS**

**Melvin H. Keyes, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Continuation-in-part of Ser. No. 193,468, Oct. 28, 1971, abandoned. This application Dec. 20, 1971, Ser. No. 209,741**
**Int. Cl. G01n** *27/46*
**U.S. Cl. 204—1 T** **6 Claims**




1. A potentiometric method for selectively determining the concentration of alkaline phosphatase of an aqueous fluid sample, comprising;

a. diluting the aqueous fluid sample with a buffered aqueous solution having a pH in the range of about 8.5 to about 9;

b. providing a potentiometer electrically connected in series to a D-serine specific electrode and a reference electrode, wherein the D-serine specific electrode is provided with an ammonium ion-sensitive membrane in contact with and substantially encapsulated by a coating of insolubilized D-serine deaminase, said coating containing a catalytically effective amount of D-serine deaminase and being permeable to both the aqueous fluid sample and products of the reaction of the aqueous fluid sample and the D-serine deaminase;

c. contacting the D-serine specific electrode and the reference electrode with the diluted sample;

d. recording the ionic background activity of the sample;

e. adding to the diluted sample about $5\times10^{-4}$ to about $5\times10^{-1}$ moles D-phosphoserine per liter of diluted sample;

f. and recording the incremental change in potential at regular intervals for a period ranging from about 5 to about 15 minutes.

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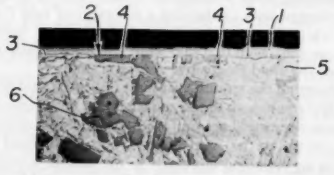
**3,896,009**

**ALUMINUM ALLOY CYLINDER**

**Torao Kobayashi, and Chikato Ninagawa, both of Tokyo, Japan, assignors to Kioritz Corporation, Tokyo, Japan**

**Filed July 9, 1974, Ser. No. 487,213**
**Claims priority, application Japan, May 21, 1974, 49-56833**
**Int. Cl.[2] C25D** *7/04;* **F02F** *1/00;* **C25D** *5/44*
**U.S. Cl. 204—26** **8 Claims**




1. In a process for providing an aluminumsilicon hypereutectic alloy cylinder, the improvements comprising the steps of:

machining and finishing the sliding surface of said cylinder to a given dimension so that finished primary crystal grains of silicon clearly appear on said sliding surface;

subjecting said finished surface to pickling activating treatment to remove eutectic aluminum solid solution surrounding the primary crystal grains of silicon to a given depth in the manner that said primary crystal grains of silicon are not substantially corroded and are left intact; electroplating on said sliding surface having thus been treated by said pickling-activating treatment a metal or alloy which is capable of improving the sliding performance of said sliding surface in relation to a mating surface, said metal or alloy being selected from the group consisting of lead, tin, copper, zinc, iron, nickel, silver, and alloys thereof;

whereby said electroplated metal surfaces and the top finished surfaces of primary crystal grain silicon provide a desired sliding surface in combination.

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**3,896,010**

## PROCESS AND APPARATUS FOR THE COATING OF AN ELECTRICALLY CONDUCTIVE FIBROUS STRAND

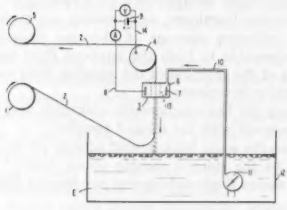
**Jochen Vetter, Karlsfeld, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany**

**Filed Oct. 16, 1972, Ser. No. 297,851**

**Claims priority, application Germany, Oct. 16, 1971, 2151618**

**Int. Cl. C23b** *5/58*

**U.S. Cl. 204—28** **11 Claims**



1. A process for the coating and treatment of an electrically conductive fiber strand made of a multiplicity of individual filaments of a quasi infinite length, said filaments in said fiber strand being twisted together, which comprises the steps of:

electrically connecting the fiiber strand to a voltage source to act as a cathode,

passing the strand through an anode-equipped whirl chamber,

supplying fluid electrolyte to said whirl chamber from a storage tank containing a reservoir of said fluid electrolyte, said whirl chamber being separated from said storage tank such that said whirl chamber is substantially free of the fluid electrolyte reservoir, and

subjecting the strand to at least one jet of said fluid electrolyte to open up the strand such that the filaments throughout the strand are uniformly treated exclusively with said electrolyte jet, said at least one jet of fluid electrolyte being suppliled annularly to the strand, wherein each jet of electrolyte is arranged with a sinusoidal line in the axial direction of the strand and annularly to the strand in a direction counter to the direction of the twist in said strand.

**3,896,011**

## PROCESS FOR THE PREPARATION OF SEBACIC ACID

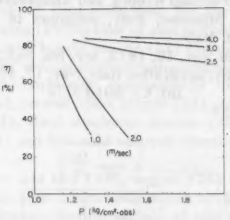
**Toshiro Isoya; Rinichi Kakuta, and Chikayuki Kawamura, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Jan. 24, 1974, Ser. No. 436,275**

**Claims priority, application Japan, Jan. 31, 1973, 48-11883; Mar. 26, 1973, 48-34863; Oct. 3, 1973, 48-111218; Dec. 17, 1973, 48-141604**

**Int. Cl. C07b** *29/06;* **C07c** *51/02, 69/50*

**U.S. Cl. 204—59 R** **13 Claims**




1. In a process for preparing dimethyl sebacate comprising subjecting to an electrolytic condensation in an electrolytic cell a solution of monomethyl adipate and an alkali salt thereof in methanol, the improvement which comprises maintaining the concentration of dimethyl sebacate in the solution at a level of at least 5% by weight, and passing the solution through the cell at a liquid velocity of at least 2.5 m/sec.

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**3,896,012**

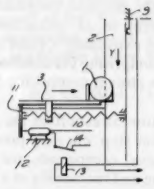
## ELECTROCHEMICAL METAL-REMOVAL METHOD

**Edwin Buschbaum; Siegfried Motschmann, and Gert Strenge, all of Leipzig, Germany, assignors to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany**

**Filed June 27, 1972, Ser. No. 266,751**

**Int. Cl. B23p** *1/00, 1/12*

**U.S. Cl. 204—129.46** **10 Claims**



1. A method of electrochemically removing metal from a workpiece, comprising the steps of connecting a metallic workpiece and a metallic work tool having surface high-points each to a different terminal of a source of electrical energy, so that the workpiece and work tool can be used as the anode and cathode, respectively, of an electrolytic reaction; effecting relative movement between said workpiece and said work tool in a first direction, associated with penetration of said work tool into said workpiece; effecting relative movement between said workpiece and said work tool in a second direction transverse to said first direction; passing an electrolyte between and in contact with said work tool and said workpiece; establishing a current flow between said work tool and said workpiece to effect oxidation of the metal of said workpiece and the generation of hydrogen gas; and establishing continual physical and electrical contact between the work tool and the workpiece to an extent causing the development of momentary short-circuits between surface high-points on said workpiece and said work tool to ignite hydrogen gas in

the immediate vicinity of the short-circuiting surface high-points and to effect localized heating and softening of the material of the workpiece in the immediate vicinity of the short-circuiting surface high-points.

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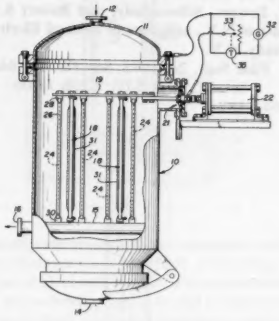
**3,896,013**

## PROCESS FOR REMOVING METALLIC IONS FROM AN ELECTROLYTIC SOLUTION

**James F. Zievers, LaGrange, Ill., assignor to Industrial Filter and Pump Mfg. Co., Cicero, Ill.**

**Filed Feb. 25, 1974, Ser. No. 445,544**
**Int. Cl. C02c** *5/12;* **B01k** *3/02, 3/08*
**U.S. Cl. 204—149** **6 Claims**



1. A process for removing metal ions from a solution, comprising the steps of

depositing a porous cake of carbon particles on a foraminous substrate by flowing a liquid in which said particles are entrained through said substrate, and

passing said solution through said cake and said substrate while maintaining said cake at a negative electric potential relative to an anode immersed in said solution in spaced relationship to said cake,

whereby said metal ions are deposited on the surfaces of said particles.

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**3,896,014**

## UV CURABLE POLYENE-POLYTHIOL-SURFACTANT COMPOSITIONS

**Ira Rosenberg, West Norwalk, Conn., assignor to Clairol Incorporated, New York, N.Y.**

**Filed June 14, 1973, Ser. No. 370,071**
**Int. Cl.[2] C08F** *2/50, 4/28;* **C08L** *75/00*
**U.S. Cl. 204—159.23** **39 Claims**

1. A photocurable liquid nail lacquer composition comprising in photocurably effective amounts as separate components distinct from each other from 1% to about 98.5% by weight of a mixture of a polyene component and 0.5% to 1.0% by weight of a polythiol component, 1% to 10% by weight of a photocuring rate accelerator component and a surfactant which is soluble in said liquid composition and selected from the group consisting of sorbitan sesquioleate, sorbitan dioleate, sorbitan trioleate, pentaerythritol dioleate, pentaerythritol trioleate, glyceryl monooleate, glyceryl dioleate, glyceryl trioleate, polyglycerol ester of oleic acid, alkenyldimethylethyl ammonium bromide, di "coco" dimethyl ammonium chloride, and quaternary imidazolinium salt (from stearic acid) wherein:

A. Said polyene component being a terminally unsaturated polyene which comprises the formula:

$$[A]_m(X)_m$$

herein $m$ is an integer of at least 2, wherein X is

where $f$ is an integer from 1 to 9; R is a radical selected from the group consisting of hydrogen, fluorine, chlorine, furyl, thienyl, pyridyl, phenyl and substituted phenyl, benzyl and substituted benzyl, alkyl and substituted alkyl, alkoxy and substituted alkoxy, cycloalkyl and substituted cycloalkyl; said substituents on said substituted members being selected from the group consisting of nitro, chloro, fluoro, acetoxy, acetamide, phenyl, benzyl, alkyl, alkoxy and cycloalkyl; said alkyl and alkoxy having from one to nine carbon atoms and said cycloalkyl having from three to eight carbon atoms; wherein [A] is free of reactive non-aromatic carbon-to-carbon unsaturation; free of highly water sensitive members, and is a polyvalent chemically compatible member of the group consisting of carbonate, carboxylate, carbonyl, ether, silane, silicate, phosphonate, phosphite, phosphate, alkyl and substituted alkyl, cycloalkyl and substituted cycloalkyl, aryl and substituted aryl, urethane and substituted urethane, urea and substituted urea, amine and substituted amine, amide and substituted amide, hydroxyl, heterocyclic carbon containing radical, and mixtures thereof, said substituents on said members being defined above, said component having a molecular weight in the range from about 64 to 20,000; and a viscosity in the range from essentially 0 to 20 million centipoises at 70°C; and

B. said polythiol component having a molecular weight in the range from about 50 to about 20,000 of the general formula:

$$R_a(SH)_n$$

wherein $R_a$ is a polyvalent organic moiety free from reactive non-aromatic carbon-to-carbon unsaturation and $n$ is at least 2, the sum of $m$ and $n$ being greater than 4, with the ene/thiol mole ratio being in the range of about 0.50:1.0 to 1.5:1.0 so as to provide a cross-linked solid, self-supporting cured product.

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**3,896,015**

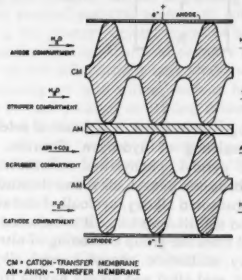
## METHOD AND APPARATUS FOR SEPARATING WEAKLY IONIZABLE SUBSTANCES FROM FLUIDS CONTAINING THE SAME

**Wayne A. McRae, Lexington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.**

**Filed July 24, 1968, Ser. No. 747,158**
**Int. Cl. B01d** *13/02;* **B01k** *1/00*
**U.S. Cl. 204—180 P** **13 Claims**

7. A method of separating a weakly ionizable substance from fluid mixtures containing the same comprising passing said fluid mixture in the presence of moisture through a scrubber compartment of a four compartment electrolytic unit, said unit defined on its outer ends by anode and cathode electrodes, three ion exchange membranes between said electrodes defining said four compartments, the first and second of said membranes being of a like charge type and different from the charge type of the third membrane, said like charged membranes being adjacent to each other and to the electrode of the opposite charge sign, said membranes of like charge thereby forming a scrubber compartment there-between, embossments on at least one of said membranes of like charge, said embossments contacting at least the other of said membrane of like charge thereby providing a current path and a fluid passage through said scrubber compartment, passing water through the anode and cathode compartments, passing a direct electric current between the electrodes transversely

through all four compartments, removing at least part of said weakly ionizable substance from the stripper compartment




defined between the membranes of unlike charge and removing at least a partially purified fluid mixture from the scrubber compartment defined between the membranes of like charge.

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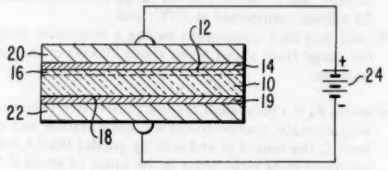
**3,896,016**

**FABRICATION OF LIQUID CRYSTAL DEVICES**

**Lawrence Alan Goodman, East Windsor, N.J., and David Emil Carlson, Yardley, Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed July 5, 1974, Ser. No. 486,244**
**Int. Cl. B01d** *13/02*
**U.S. Cl. 204—180 R** **4 Claims**




1. In the fabrication of a liquid crystal device comprising a pair of oppositely disposed substrates of an alkali-containing glass, first surfaces of each of said substrates being disposed in oppositely disposed, facing relationship, the method comprising:

coating each of said first surfaces of said substrates with a layer of an electrically conductive material,

depleting alkali ions from a region of each substrate immediately beneath said conductive material layer thereon using a process in which the positive terminal of a DC power supply is electrically connected to said first surface of each substrate through said conductive layer thereon, a second surface of each of said substrates spaced from said first surface thereof being electrically connected to the negative terminal of said power supply, and

assembling said substrates with said first surfaces in facing relationship.

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**3,896,017**

**ELECTRODEPOSITION OF THERMOSETTING COATING AT THE CATHODE**

**Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.**

**Filed Mar. 1, 1973, Ser. No. 337,007**
**Int. Cl. B01k** *5/02*
**U.S. Cl. 204—181** **6 Claims**

1. A method of electrodepositing a thermosetting coating at the cathode of a unidirectional electrical system comprising passing a unidirectional electrical current through an aqueous electrocoating bath comprising water having dispersed therein a water dispersible salt of an acid with an hydroxy functional polyamine resin, said polyamine resin being the reaction product of a solvent-soluble epoxy resin advanced by reaction with up to about 10% by weight of diisocyanate and reacted with monosecondary amine to be substantially devoid of epoxy functionality, said polyamine resin being precondensed with from 2% to 60%, based on the total weight of resin, of a water dispersible heat-hardening phenolic resin to cause the codeposition of said polyamine resin and said phenolic resin in the form of a film of coating at the cathode, removing the coated cathode from said bath and then baking the coated cathode to cure said polyamine resin by reaction thereof with said phenolic resin.

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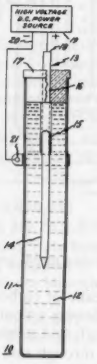
**3,896,018**

**METHOD OF FORMING BETA-ALUMINA ARTICLES**

**Robert W. Powers, Schenectady, and Robert S. Owens, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Sept. 24, 1973, Ser. No. 400,046**
**Int. Cl. B01k** *5/00;* **C23b** *13/00*
**U.S. Cl. 204—181** **7 Claims**




1. A method of forming a beta-alumina article which comprises providing a suspension consisting of beta-alumina particles the majority of which have a diameter in the range of 1 to 2 microns in an organic fluid having a dielectric constant at 25°C of from 12 to 24, adding 0.05 to 0.5 percent aluminum stearate by weight of the betaalumina to the suspension, electrophoretically depositing the beta-alumina particles from the suspension as a dense deposit onto a charged electrode in a DC electric field of from 100 to 10,000 volts per centimeter, drying the deposit on the electrode, removing the deposit from the electrode, and sintering the deposit in an oxygen oxidizing atmosphere at a temperature between 1700 and 1825°C resulting in a dense, sintered beta-alumina article.

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**3,896,019**

**METHOD OF FORMING BETA-ALUMINA ARTICLES**

**Stephan P. Mitoff, Elnora; Robert W. Powers, Schenectady, and Randall N. King, Johnstown, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 4, 1973, Ser. No. 403,454**
**Int. Cl.[2] C04B** *35/10, 35/64;* **C25D** *1/14*
**U.S. Cl. 204—181** **6 Claims**

1. A method of forming a beta-alumina article which comprises providing a plurality of beta-alumina particles the majority of which have a diameter from submicron size to 5 microns, forming the particles into greenware with a density of at least 40 percent of the theoretical density, and passing the greenware at a temperature between 1650° and 1825°C through a preheated oxygen oxidizing atmosphere and at a controlled passage rate of from one-half to four inches per

minute with greenware exposure to such temperature ranging from about 6 minutes to ¾ minute resulting in a dense, sintered beta-alumina article.

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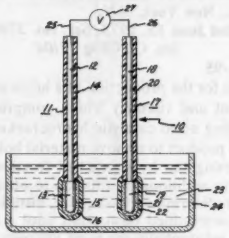
**3,896,020**

## CARBON DIOXIDE AND pH SENSOR

**Oliver H. Le Blanc, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 2, 1974, Ser. No. 493,863**
**Int. Cl. G01n** *27/46*
**U.S. Cl. 204—195 M** **8 Claims**



1. A carbon dioxide sensor which comprises a carbon dioxide insensitive hydrogen ion electrode comprising a flexible metallic elongated electrode lead, an electrochemically active region at one end adhering tightly to and in electrical contact with the electrode lead, electrical insulation surrounding the remainder of the electrode lead, an electrolyte containing a hydrogen ion buffering system and an ion which enters into equilibrium with the electrochemically active region of the lead contacting the electrochemically active region, and an outer sheath of a membrane selectively permeable to hydrogen ion and also permeable to carbon dioxide encapsulating the electrochemically active region and the electrolyte, the hydrogen ion permeable membrane material being a hydrophobic elastomer with a dielectric constant of from 4 to 13, and a hydrophobic and lipophilic $H^+$ ion carrier; a separate, spaced apart, carbon dioxide sensitive hydrogen ion electrode comprising a flexible, elongated electrode lead, an electrochemically active region at one end adhering tightly to and in electrical contact with the electrode lead, electrical insulation surrounding the remainder of the electrode lead, an unbuffered electrolyte containing bicarbonate ions and an ion which enters into equilibrium with the electrochemically active region of the lead contacting the electrochemically active region, and an outer sheath of a membrane selectively permeable to hydrogen ions and also permeable to carbon dioxide encapsulating the electrochemically active region and the electrolyte, the hydrogen ion permeable and carbon dioxide permeable membrane material being a hydrophobic elastomer with a dielectric constant of from 4 to 13, and a hydrophobic and lipophilic $H^+$ ion carrier; and the electrodes being electrically connected.

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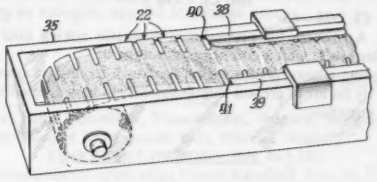
**3,896,021**

## AUTOMATED ELECTROPHORESIS INSTRUMENT

**Egil Fosslien, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.**

**Filed Oct. 22, 1974, Ser. No. 516,982**
**Int. Cl. B01k** *5/00*
**U.S. Cl. 204—299** **8 Claims**

1. Automated electrophoresis apparatus comprising:
an elongated electrophoretic separation chamber defining a pair of elongated electrolyte wells;
electrolyte media contained within said wells;
electrode means contained within said media;
an elongated, flexible, coated plastic tape divided into transverse segments and mounted for movement longitudinally with respect to said separation chamber;
deflecting means mounted adjacent the top of said separation chamber and operable to flex the lateral ends of the



segments of said tape so as to make electrical contact with said electrolyte media; and
a source of DC power connected to said electrode means and operable to establish an electrical field transversely across said tape whereby electrophoretic separation can take place on the coated surface of said tape.

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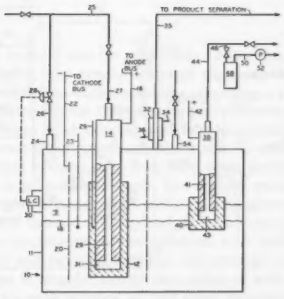
**3,896,022**

## APPARATUS FOR SEPARATING LIQUIDS

**William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 143,892, May 17, 1971, Pat. No. 3,798,144, which is a division of Ser. No. 858,734, Sept. 17, 1969, Pat. No. 3,617,453. This application Jan. 10, 1974, Ser. No. 432,131**
**Int. Cl. B03c** *5/02*
**U.S. Cl. 204—302** **6 Claims**




1. Apparatus comprising, in combination:
a vessel for containing a body of a first liquid having a body of a second liquid, substantially insoluble in said first liquid, disposed as a layer on the surface of said first liquid;
a phase splitter means comprising an electrically conductive porous cup disposed in said vessel, adapted to extend through said layer of second liquid and into said first liquid, for selectively separating one of said liquids from the other said liquid;
means for causing said one liquid to selectively flow into said phase splitter and be removed from said vessel; and means for applying a positive electric voltage to said cup to increase the selectivity of said cup for the flow of said one liquid through the pores of and into said cup.

3,896,023

## PROCESS FOR PRODUCING SYNTHETIC COKING COAL

Hiromi Ozaki, Urawa; Mamoru Yamane, and Haruo Yoshikai, both of Tokyo, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1974, Ser. No. 438,861
Claims priority, application Japan, Feb. 3, 1973, 48-13369
Int. Cl. C10g 9/00
U.S. Cl. 208—46 7 Claims

1. A process for preparing a synthetic coking coal or a binder pitch, which comprises the steps of:

coking a heavy hydrocarbon feedstock having an aromaticity factor fa greater than 0.4, wherein fa is defined by the equation:

$$fa = \frac{C/H - \frac{1}{2}(H\alpha/H) - \frac{1}{2}(H\sigma/H)}{C/H}$$

and wherein C/H represents the ratio of carbon atoms to hydrogen atoms, Hα/H represents the ratio of the hydrogen atoms in the α-position of the aliphatic hydrocarbon groups attached to the aromatic rings to the total hydrogen atom content, and Hσ/H represents the ratio of the hydrogen atoms in the β-position or higher positions of the aliphatic hydrocarbon groups attached to the aromatic rings to the total hydrogen atom content at a temperature greater than that which initiates cracking; and

recovering said synthetic coking coal or binder pitch from said coking step.

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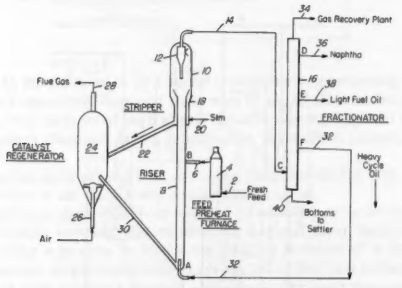
3,896,024

## PROCESS FOR PRODUCING LIGHT FUEL OIL

Donald M. Nace, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 2, 1974, Ser. No. 457,281
Int. Cl. C10g 37/02; C01b 33/28
U.S. Cl. 208—74 10 Claims




1. A method for producing light fuel oil and lower boiling hydrocarbons which comprises:

combining a heavy cycle oil product of catalytic cracking with freshly regenerated catalyst particles to form a suspension at a temperature in the range of 900°F. to 1000°F., passing the suspension upwardly through a riser conversion zone under limited conversion conditions designed to produce light fuel oil product and deposit from about 0.5 to about 1.2 weight percent carbon on the suspended catalyst particles,

combining a fresh gas oil feed with said suspension of carbon containing catalyst and cycle oil conversion products in an amount to form a second suspension of reduced temperature within the range of about 800°F. to about 900°F.,

passing the second suspension through a riser conversion zone under conversion conditions selected to particularly produce light fuel oil product,

separating the hydrocarbon product of said cycle oil and said gas oil conversion from catalyst particles and then into hydrocarbon fractions comprising gasoline and lower boiling components, a light fuel oil product fraction, a heavy cycle oil product fraction and a high boiling residual material, and

recracking the separated heavy cycle oil fraction with freshly regenerated catalyst as above defined.

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3,896,025

## PRODUCTION OF IMPROVED LUBRICATING OILS

Richard L. Coleman, Port Arthur; Billy H. Cummins, Nederland, and Ambrose J. Startz, Groves, all of Tex., assignors to Texaco, Inc., New York, N.Y.

Filed June 15, 1973, Ser. No. 370,246
Int. Cl. C10g 13/04
U.S. Cl. 208—95 9 Claims

1. A process for the production of a lubricating oil of specified flash point and viscosity which comprises subjecting a crude lubricating oil to catalytic hydrocracking, distilling the hydrocracked product to remove material boiling up to about 600°F., subjecting the hydrocracked fraction boiling above about 600°F. to additional distillation to obtain a lubricating oil having a predetermined flash point, distilling said lubricating oil of predetermined flash point until a heart cut is obtained having substantially the same viscosity as said fraction boiling above about 600°F., returning the remainder of the hydrocracked fraction boiling above said heart cut to the hydrocracking zone and dewaxing said heart cut.

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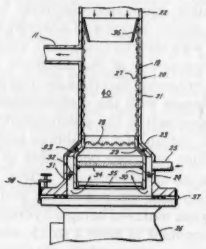
3,896,026

## METHODS AND APPARATUS FOR FORMING A DENSE PHASE CATALYST TRANSFER SYSTEM

John P. MacLean, Stafford; Dorrance P. Bunn, and Adolph S. Mager, both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,321
Int. Cl. B07b 7/06
U.S. Cl. 209—250 10 Claims



1. A method for forming a dense phase catalyst transfer system having a conduit with loading air admitted thereto for rapid transit of a catalyst mixture including foreign debris material from one element to another element in a fluid catalytic cracking unit comprising the steps of,

a. passing the catalytic mixture through a debris collector for removing substantially all foreign debris material therefrom, and

b. using a conduit of a smaller diameter than would be required for said catalyst mixture to increase the flowing density of the pure catalyst in the conduit.

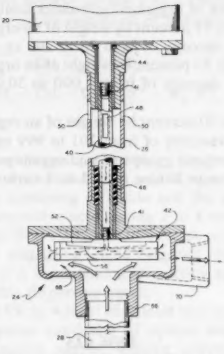
## 3,896,027
## METHOD OF TREATING SEWAGE TO ENHANCE AEROBIC DECOMPOSITION

**Kenneth A. Digney, Woodchuck Hill Rd., Fayetteville, N.Y. 13066, and Alfred P. Gallauresi, 112 Wycliffe Rd., Solvay, N.Y. 13209**

**Continuation-in-part of Ser. No. 372,776, June 22, 1973. This application Mar. 19, 1974, Ser. No. 452,602**

**Int. Cl. C02c** *1/12*

**U.S. Cl. 210—14** **6 Claims**



1. A method of treating sewage to enhance aerobic decomposition thereof comprising:
   a. placing the sewage, substantially in a liquid state, into a container;
   b. pumping the sewage through an impeller pump having inlet and outlet openings both within the container;
   c. converting a portion of the velocity energy of the sewage passing through the pump to pressure energy; and
   d. mixing air into the sewage passing through said pump by ejecting air from an opening in at least one impeller blade of the pump.

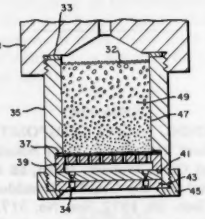
## 3,896,028
## PARTICULATE METAL FILTER MEDIUM FOR POLYMER MELTS

**William Lewis Phillips, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.**

**Filed Nov. 29, 1973, Ser. No. 420,323**

**Int. Cl. B01d** *23/10*

**U.S. Cl. 210—152** **4 Claims**



3. In a spinning pack assembly including a filter body through which polymer flows from a pressurized source to a spinneret for forming filaments, the improvement comprising: said body containing a bed of irregularly shaped rough surfaced metal particles having a shape factor of less than about 0.58, said bed being characterized by a porosity of at least 60 percent under no applied load and by compaction of no more than about 20 percent or about 30 percent under applied loads of about 5,000 pounds per square inch or 10,000 pounds per square inch respectively, said metal particles being formed from an alloy, said alloy consisting essentially of about 30 percent to about 40 percent by weight chromium; about 2 percent to about 4 percent by weight silicon, 100 to 400 parts per million by weight carbon; 600 to 1,000 parts per million by weight nitrogen; and the remainder iron.

## 3,896,029
## SWITCHING VALVE FOR CONTINUOUS FILTERING DEVICES

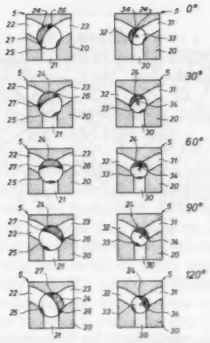
**Marcel Leon Beuselinck, Wommelgem, Belgium, assignor to Agfa-Gevaert Aktiengesellschaft, Mortsel, Belgium**

**Filed Feb. 15, 1974, Ser. No. 443,100**

**Claims priority, application United Kingdom, Feb. 16, 1973, 7839/73**

**Int. Cl. B01d** *29/36*

**U.S. Cl. 210—341** **5 Claims**




1. A flow control unit for selectively controlling fluid flow from a common inlet conduit through two loop-shaped flow paths into a common outlet conduit comprising a valve housing having at one section thereof a supply inlet port connected to said common inlet conduit and two loop inlet ports arranged in generally regularly angularly spaced relation about the axis of said housing, said loop inlet ports having substantially equal cross-sectional areas, and a valve member rotatable within said housing about said axis, said member having at one section thereof a main feed passage extending therethrough for continuous communication with said common inlet conduit and defining between said passage ends a wall section larger in angular extent that either of said loop inlet ports whereby upon rotation of said valve members either of said ports can be exclusively in communication with said feed passage and the other closed by said wall section or both said ports partially in communication therewith, and said valve member also having two substantially symmetrically arranged bleed passages extending from said feed passage through said wall section at loci spaced respectively from the corresponding ends of said wall section periphery and of said feed passage and from each other to maintain flow continuity during rotation of said valve member; said valve housing having at a second axially spaced section a supply discharge port connected to said outlet conduit and two loop discharge ports arranged in generally regularly spaced relation about the axis of said housing, said loop outlet ports having substantially equal cross-sectional areas, said valve member having at a second section thereof a discharge passage extending therethrough for establishing upon rotation of said valve member intercommunication between said supply discharge port and

said loop discharge ports alternatively or both said loop discharge ports partially in correspondence with said inlet ports, and said valve member also having a vent passage extending from a locus on the valve member periphery generally intermediate the ends of said discharge passage to the outside atmosphere for venting the loop discharge port not is communication with said supply discharge port.

5. The control unit of claim 1 wherein each of said loop-shaped flow paths include a filtration unit.

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**3,896,030**

## FILTER PRESS, PARTICULARLY FOR DEWATERING SLUDGE IN SEWAGE TREATMENT PLANTS

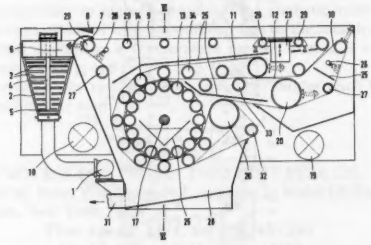
**Albert Bahr, Parallelstrasse 2a, D-6683 Elversberg, Saar, Germany**

**Filed May 28, 1974, Ser. No. 473,589**

**Claims priority, application Germany, Aug. 28, 1973, 2343324The portion of the term of this patent subsequent to July 3, 1990, has been disclaimed.**

**Int. Cl. B01d** *33/14*

**U.S. Cl. 210—384** **12 Claims**



1. Filter press, particularly for dewatering sludge in sewage treatment plants, comprising two endless filter belts that retain the sludge between them, said two filter belts circulating simultaneously and being guided in concentric paths around a rotary drum against which they are held by adjustable pressure rollers in a manner that the liquid phase is squeezed out of the sludge, said two filter belts travelling along horizontal sections situated above the drum before reaching said rotary drum, the sludge being pre-treated in these sections before entering between the two filter belts around the drum.

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**3,896,031**

## PREPARATION OF COLLOIDAL SOLID SUSPENSIONS IN AQUEOUS SOLUTIONS

**Leroy L. Carney, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**

**Filed Apr. 20, 1973, Ser. No. 353,060**

**Int. Cl. C10m** *3/34, 3/30*

**U.S. Cl. 252—8.5 C** **9 Claims**

1. An additive for forming a colloidal suspension of asphaltic solids in an aqueous solution in the absence of oil which comprises:

colloidal asphaltic solids; and

a dispersant present in said additive in an amount in the range of from about 1% to about 50% by weight thereof consisting of a mixture of waste lignin liquor present in an amount in the range of from about 25% to about 75% by weight of said mixture and an amide present in an amount in the range of from about 25% to about 75% by weight of said mixture, said amide being formed by reacting a saturated or unsaturated fatty acid having in the range of from about 14 to about 18 carbon atoms with N-methyl taurine.

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**3,896,032**

## DIORGANOPOLYSILOXANE-BASED LUBRICANT FOR ORGANIC FIBERS

**Anton Stroh, Munich, and Leonhard Gollwitzer, Jetzendorf, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany**

**Filed Dec. 8, 1972, Ser. No. 313,292**

**Claims priority, application Germany, Dec. 13, 1971, 2161813**

**Int. Cl. D06m** *11/00*

**U.S. Cl. 252—8.6** **4 Claims**

1. A lubricating composition for organic fibers which comprises a mixture of organopolysiloxanes containing:

a. from 10 to 75 percent by weight of an organopolysiloxane having a viscosity of from 20 to 200 cs. at 25°C.,

b. from 10 to 50 percent by weight of an organopolysiloxane having a viscosity of from 1,000 to 30,000 cs. at 25°C., and

c. from 0 to 80 percent by weight of an organopolysiloxane having a viscosity of from 201 to 999 cs. at 25°C.,

in which the organo groups of said organopolysiloxanes consist of alkyl groups having from 1 to 5 carbon atoms.

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**3,896,033**

## ENCAPSULATED FABRIC SOFTENER

**John Edward Grimm, III, New York, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.**

**Filed July 3, 1972, Ser. No. 268,598**

**Int. Cl. D06m** *13/00*

**U.S. Cl. 252—8.8** **8 Claims**

1. A fabric softener in particulate capsule form for the treatment of fibrous materials which consists essentially of at least one fabric softening compound selected from the group consisting of quaternary ammonium fabric softeners, alkyl pyridine salts, alkyl imidazolines, higher alkyl primary, secondary or tertiary amines, higher alkyl guanidine salts, higher alkyl morpholinium chlorides, higher alkyl beta-alanines, N-higher alkyl taurines, N-higher alkyl aspartic acids, betaines and sulfobetaines suitable for treatment of damp laundry to soften it and improve the anti-static properties thereof when the laundry contains materials which are prone to the accumulation of static charges, said softener having a coating of a water-soluble or dispersible organic polymeric colloid material, said coating being from 0.001 to 2 millimeters thick over at least 40% of the surface of said softening compound, the capsule particles having a thickness of from 1 to 4 millimeters.

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**3,896,034**

## SOFTENING AGENT COMPOSITIONS

**Hans-Werner Eckert, Dusseldorf; Peter Nikolaus, Dusseldorf-Holthausen, and Claus Werner, Haan, all of Germany, assignors to Henkel and Cie GmbH, Dusseldorf, Germany**

**Filed Dec. 20, 1972, Ser. No. 317,058**

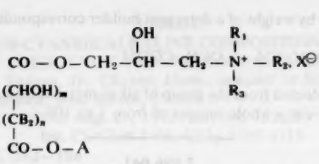
**Claims priority, application Germany, Dec. 27, 1971, 2164742; Dec. 27, 1971, 2164743**

**Int. Cl. D06m** *13/46*

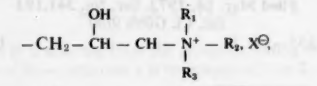
**U.S. Cl. 252—8.8** **10 Claims**

1. A liquid or powdery softening agent composition for washed textiles consisting essentially of

a. from 1 to 50% by weight of a 3-acyloxy-2-hydroxypropyltrialkylammonium compound of the formula



wherein $m$ and $n$ are integers from 0 to 4 and the sum of $m + n$ is an integer from 0 to 4, $R_1$ and $R_2$ are selected from the group consisting of alkyl and alkenyl having from 10 to 24 carbon atoms, $R_3$ is alkyl having 1 to 4 carbon atoms, A is selected from the group consisting of hydrogen and



B is selected from the group consisting of hydrogen and, when $m = 0$ and $n = 1$, methyl and ethyl, and $X^-$ is an anion selected from the group consisting of halide and the anion of an organic non-surface-active acid having 2 to 8 carbon atoms,

b. from 0.2 to 10% by weight of at least one nonionic surface-active dispersing agent selected from the group consisting of a water-soluble dispersing agent and a water-dispersible dispersing agent,

c. from 0 to 15% by weight of at least one member selected from the group consisting of optical brighteners, antimicrobial active agents, souring agents, sequestering agents, perfumes and dyes, and

d. the remainder up to 100% by weight of at least one diluent selected from the group consisting of water, and water-soluble or readily water-dispersible liquid and solid carriers.

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**3,896,035**

## PILE FABRIC TREATING COMPOSITION PROVIDING SOIL RESISTANCE

**William J. Schultz, White Bear Lake, and Samuel Smith, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed Apr. 2, 1973, Ser. No. 346,838**
**Int. Cl. D06m** *13/42*
**U.S. Cl. 252—8.75** **3 Claims**

1. A treating solution for rendering pile fabrics stain-repellent and soil-resistant while avoiding an increase in flammability, consisting essentially of a dispersion in liquid medium at a total solids concentration of from about 0.1 to about 50% by weight of the combination of fluoroaliphatic radical-containing urethane adduct and fluoroaliphatic radical free urethane adduct in proportions of from about 1:1.5 to about 4:1 each of said adducts melting to a flowable liquid at above 45° C. and below about 200° C.

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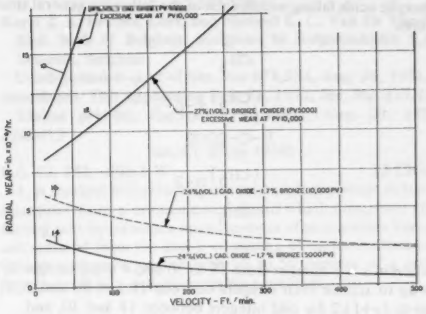
**3,896,036**

## BEARING COMPOSITIONS

**James Cairns, Cherry Hill, N.J., assignor to Garlock Inc., Palmyra, N.Y.**

**Filed Mar. 17, 1969, Ser. No. 807,868**
**Int. Cl. C10m** *7/28, 7/02*
**U.S. Cl. 252—12** **11 Claims**

1. A plain bearing material comprising, in percent by volume, from about 40% to about 95% of a fluorocarbon resin, from about 5% to about 60% of cadmium or an oxide of cadmium, and from about 0.1% to about 35% of a filler selected from the class consisting of copper, alloys of copper, quartz, and glass.

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**3,896,037**

## HIGH BASIC SULFONATE PROCESS

**Charles R. Dickey, Covina, Calif., assignor to Bray Oil Company, Los Angeles, Calif.**

**Filed Dec. 27, 1971, Ser. No. 212,661**
**Int. Cl.² C10M** *1/40*
**U.S. Cl. 252—33.4** **5 Claims**

1. The method of making highly overbased oil soluble sulfonates of metals of Group 2 of the Periodic System characterized by low viscosity and high clarity, with alkali values upwards of 250 which comprises the following steps:

1. Preparing a complex of said Group 2 metal, methanol and $CO_2$ by reacting said metal or oxide thereof with anhydrous methanol and $CO_2$-mixing sufficient complex with oil soluble sulfonate and hydrocarbon lubricating oil to provide a base number in excess of 250 in the final product, in the presence of a volatile hydrocarbon solvent to reduce viscosity;
2. Heating the resulting mixture above the boiling point of methanol but below the point of incipient gel formation, thereby distilling off the major amount of anhydrous methanol present in anhydrous form suitable for recycling in the process;
3. Initially treating the resulting mixture at 180°–210°F. with a critically limited amount of liquid water determined by the formula: Mols of water = 0.6 to 1.5 (mols of overbasing oxide) + 1.2 to 3 (atoms of overbasing metal) - mols of water present in the methanol and sulfonate;
4. Stripping methanol from the initially water treated sulfonate mixture at a temperature of about 250° to 300°F;
5. Again treating the mixture with an excess of liquid water at least equal to the amount used in the initial water treat;
6. Dehydrating the mixture at a higher temperature and filtering the product to remove unreacted metal oxide, carbonate, and contaminating solids.

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**3,896,038**

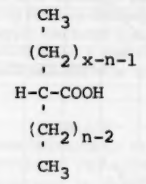
## LUBRICATING OIL CONTAINING A POLYAMIDE POUR POINT DEPRESSANT

**Robert J. Hartle, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.**

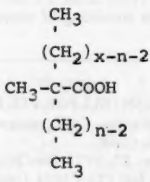
**Filed June 5, 1973, Ser. No. 367,179**
**Int. Cl. C10m** *1/32*
**U.S. Cl. 252—51.5 A** **11 Claims**

1. A lubricating composition comprising a major amount of a lubricating oil and a small amount, sufficient to improve the pour point and detergency-dispersancy characteristics of the lubricating oil, of a polyamide of a mixture of about equal amounts of secondary and tertiary monocarboxylic acids and a polyalkylene polyamine containing about 2 to about 6 alkyl-

ene units, there being from 2 to 4 carbon atoms in each alkylene group, said mixture of secondary and tertiary monocarboxylic acids falling within each of the following general structures



wherein $x$ is a number from 18 to 30 and $n$ is the integer 2, 3, 4 up to $x/2$ for even integers between 18 and 30 and 2, 3, 4 up to $(x+1)/2$ for odd integers between 18 and 30, and



wherein $x$ is a number from 18 to 30 and $n$ is the integer 2, 3, 4 up to $x/2$ for even integers between 18 and 30 and 2, 3, 4 up to $(x+1)/2$ for odd integers between 18 and 30, said polyamide containing about 1 to about 3 amine groups in addition to amide groups and being the product obtained by reacting said polyalkylene polyamine and said mixture of secondary and tertiary monocarboxylic acids at a temperature of about 250° F. (121° C.) to about 500° F. (260° C.) until the reaction is substantially complete, the proportion of said carboxylic acid mixture and the polyalkylene polyamine being such that there are from about 1 to about 3 moles less acid than the number of available amino groups in the polyamine.

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## 3,896,039
## DUST ENTRAPMENT COMPOSITION

**Charles H. Jacoby, Dalton, Pa., assignor to Akzona Incorporated, Asheville, N.C.**

**Filed Mar. 5, 1973, Ser. No. 337,964**
**Int. Cl. C09k** *3/22*
**U.S. Cl. 252—88** **12 Claims**

1. A coating of at least two layers to be applied to the surface of a mine working for dust entrapment, the first layer adjacent the mine working surface consisting essentially of a mixture of sodium chloride, clay and water, and at least one additional layer consisting essentially of a mixture of sodium chloride, water and a water soluble complex iron cyanide selected from the group consisting of alkali metal ferrocyanide salts, alkaline earth metal ferrocyanide salts, alkali metal ferricyanide salts and alkaline earth metal ferricyanide salts.

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## 3,896,040
## DETERGENT COMPOSITION

**Andre Danesh, 8 Browne St., Brookline, Mass. 02146**

**Continuation-in-part of Ser. No. 103,792, Jan. 4, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 314,111**
**Int. Cl. C11d** *3/20, 1/00*
**U.S. Cl. 252—89** **3 Claims**

1. A laundering and cleansing detergent composition consisting essentially of an effective amount of a detergent selected from the group of non-ionic detergents, cationic detergents, anionic detergents and ampholytic detergents and from 5 to 95% by weight of a detergent builder corresponding to the formula

H —$OCH_2$ $CH_2$—$_n$ $OCH_2$ COOM

where

M is selected from the group of alkali metal and ammonium, and $n$ is a whole integer of from 1 to 100.

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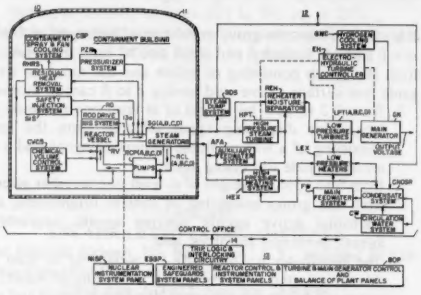
## 3,896,041
## METHOD AND SYSTEM OF SIMULATING NUCLEAR POWER PLANT COUNT RATE FOR TRAINING PURPOSES

**William H. Alliston, and Rainer H. Koenig, both of Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Mar. 14, 1973, Ser. No. 341,193**
**Int. Cl. G09b** *9/00*
**U.S. Cl. 235—151.21** **11 Claims**




1. A system for simulating the real-time operation of a nuclear power plant that includes a simulated nuclear reactor controlled to selected power levels, comprising,

a plurality of manually operable devices to provide input signals related to the operation of a simulated reactor control mechanism,

means to generate a physical value relating to the power level of a nuclear reactor in accordance with the input signals,

first counting means responsive to the generated physical value for producing an output pulse at successive time intervals related to the physical value,

second counting means driven by the output pulses of the first counting means to produce an output pulse upon the counting of each of successive trains of differing numbers of pulses, and indicating means responsive to each of the output pulses from the second counting means.

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## 3,896,042
## LOW TEMPERATURE, LOW PRESSURE HYDROGEN GETTERING

**D. Richard Anderson; Robert L. Courtney, and Larry A. Harrah, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.**

**Filed Feb. 15, 1974, Ser. No. 443,077**
**Int. Cl.[2] H01J** *7/18;* **C01B** *1/32*
**U.S. Cl. 252—184** **7 Claims**

1. A system for gettering hydrogen and its isotopes including deuterium and tritium from within a closed volume comprising a closed volume having therein a hydrogenation catalyst selected from the group of metals consisting of group VIII of the periodic table and alloys thereof, coated with a solid, organic material selected from the group consisting of dimerized propargyl phenyl ether, dimerized benzylacetylene, dimerized phenylpropiolate, dimerized biphenyl propargyl ether and polydipropargyl ether of bisphenol-A.

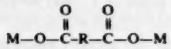
3,896,043

## NON-CYANIDE ALKALINE COMPOSITION FOR DISSOLVING NON-FERROUS METALS

Earl J. Fadgen, Jr., Clinton, Conn., assignor to Enthone, Incorporated, West Haven, Conn.

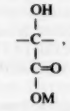
Filed Aug. 27, 1973, Ser. No. 392,169
Int. Cl. C23f *1/00*; C23g *5/00, 1/18*
U.S. Cl. 252—186 20 Claims

1. A non-cyanide alkaline aqueous solution for dissolving non-ferrous metal consisting essentially of about 15 to about 85 g/l of a water-soluble nitrate, about 0.1 to about 20 g/l of a water-soluble compound of the formula



wherein R is selected from the group consisting of a valence bond, $-CH_{2-x}-$ wherein x is an integer of 1 to 2,

wherein y is an integer of 1 to 2, and



and M is a hydrophilic cation, about 17 to about 220 g/l of a water-soluble persulfate, about 1 to about 65 g/l of a water-soluble urea compound, and ammonium hydroxide in amount sufficient to adjust the pH to within the range of about 9 to about 10.

3,896,044

## NITRO-SUBSTITUTED AROMATIC ACID CORROSION INHIBITORS FOR ALKANOLAMINE GAS TREATING SYSTEM

Blake F. Mago, New City, and Charles W. West, Niagara Falls, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 201,131, Nov. 22, 1971, Pat. No. 3,808,140, which is a continuation-in-part of Ser. No. 54,595, July 13, 1970, abandoned. This application Nov. 2, 1973, Ser. No. 412,508
Int. Cl. B01d *53/34*; C23f *11/14*
U.S. Cl. 252—192 10 Claims

1. A corrosion inhibited composition consisting essentially of an aqueous alkanolamine solution employed in acid gas removal service and an inhibiting amount of a corrosion inhibitor selected from the class consisting of:
nitro-substituted aromatic acids
and nitro-substituted acid salts.

3,896,045

## DECONTAMINATION PROCESS FOR RADIO-ACTIVE LIQUIDS

Karel J. A. Peeters, Geel, and Norbert L. C. Van De Voorde, Mol, both of Belgium, assignors to Belgonucleaire S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 174,504, Aug. 24, 1971, abandoned. This application Dec. 21, 1972, Ser. No. 317,224
Claims priority, application Germany, Aug. 29, 1972, 2242412
Int. Cl. G21c *19/46*
U.S. Cl. 252—301.1 W 13 Claims

1. A method for extracting radioactive ions present in tracer quantities from a contaminated liquid which comprises contacting said liquid with a mixed sorbent of an insoluble barium salt selected from the group consisting of barium sulfate and barium carbonate, mixed with up to 50 percent of a metal ferrocyanide in a sulfate-containing medium.

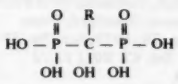
3,896,046

## COMPOSITION FOR CONTROLLING PITCH IN PAPER MANUFACTURE

Ronald A. Carstens, Anacortes, and William J. Butcher, Vancouver, both of Wash., assignors to Key Chemicals, Inc., Anacortes, Wash.

Filed Sept. 7, 1972, Ser. No. 286,975
Int. Cl. B01j *13/00*
U.S. Cl. 252—310 8 Claims

1. A colloidal aqueous dispersion for control of pitch in a paper pulp system which consists essentially of:
a. about 1 to 25 weight percent of an alumina component;
b. about 1 to 50 weight percent of an organo-phosphorus sequestering agent selected from the group consisting of: a compound having the structure

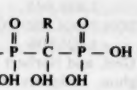


wherein R is an alkyl radical having from 1 to 5 carbon atoms; alkali metal, ammonium and ethanolamine salts of said compound, mono- and dialkyl esters of said compound with methanol, ethanol, propanol or butanol; and a salt of polymethylenediamine tetramethyl phosphonic acid having the formula

$$(H_2O_3PCH_2)_2N(CH_2)_nN(CH_2PO_3H_2)_2$$

wherein n equals 2 through 6; and
c. sodium glucoheptonate syrup in an amount of about 1 to 20 weight percent of the total dispersion.

4. A colloidal aqueous dispersion for control of pitch in a paper pulp system which consists essentially of:
a. about 1 to 25 weight percent of an alumina component comprising 25 to 75 percent by weight of a first alumina composition having an ultimate dispersed particle size no more than about one-fifth as great as a second alumina composition and correspondingly 75 to 25 percent by weight of said second alumina composition; and
b. about 1 to 50 weight percent of an organo-phosphorus sequestering agent selected from the group consisting of: a compound having the structure



wherein R is an alkyl radical having from 1 to 5 carbon atoms; alkali metal, ammonium and ethanolamine salts of said compound, mono- and dialkyl esters of said compound with methanol, ethanol, propanol or butanol; and a salt of polymethylenediamine tetramethyl phosphonic acid having the formula

$$(H_2O_3PCH_2)_2N(CH_2)_nN(CH_2PO_3H_2)_2$$

wherein n equals 2 through 6.

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**3,896,047**

## PROCESS FOR RECYCLING A COBALT HYDROFORMYLATION CATALYST

**David F. Aycock, Lenox, and Daniel E. Sliva, Pittsfield, both of Mass., assignors to General Electric Company, Pittsfield, Mass.**

**Filed June 6, 1973, Ser. No. 367,553**
**Int. Cl. B01j** *11/02*
**U.S. Cl. 252—414** **9 Claims**

1. In an improved process for recycling a cobalt hydroformylation catalyst from a hydroformylation reaction wherein an olefinic compound is reacted with carbon monoxide and hydrogen in the presence of a cobalt hydroformylation catalyst dissolved in an inert organic solvent in a reaction zone under hydroformylation conditions to produce a hydroformylation product comprising a hydroformylation compound and the cobalt hydroformylation catalyst, wherein the improvement comprises feeding the hydroformylation product into a mixing zone; adding water to the hydroformylation product in the mixing zone; feeding the mixture of water and hydroformylation product from the mixing zone into a settling zone wherein two phases are formed, a solvent phase containing the cobalt hydroformylation catalyst and a water phase containing the hydroformylation compound; separating the solvent phase therefrom and recycling said solvent phase into the initial reaction zone.

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**3,896,048**

## CATALYST COMPOSITION

**Emil J. Mehalchick, Towanda; Joseph J. Cleveland, Wysox; Robert A. Long, Towanda; Harry O. Schulze, Wyalusing, and Paul K. Marshall, Towanda, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.**

**Filed Aug. 20, 1973, Ser. No. 389,900**
**Int. Cl. B01j** *11/22*
**U.S. Cl. 252—455 R** **22 Claims**

1. A solid catalyst composition comprising essentially of a polycrystalline catalytically active inorganic complex having the formula:

$$Li_a\ Ce_b\ M_c\ M'_d\ O_x$$

wherein M is a metal selected from the group consisting of copper and iron, M' is a metal selected from the group consisting of cobalt and nickel, *a* is from about 0.1 to about 0.1, *b* is from about 0.1 to about 1, *c* is from about 0.25 to about 2.0, *d* is from about 0.25 to about 1.0 and x varies in direct chemical relationship to the values of a, b, c and d.

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**3,896,049**

## METHOD OF FORMING CO-PRECIPITATED MATERIAL

**Dennis D. Dworak, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Dec. 3, 1973, Ser. No. 421,140**
**Int. Cl. B01j** *11/08*
**U.S. Cl. 252—466 J** **8 Claims**

1. A method of forming an improved material having a matrix including oxidized, uniformly dispersed active and carrier materials so as to be useful, not only as a catalyst, but also as an adsorbent to adsorb from a liquid a high concentration of contaminants selected from the group consisting of arsenic and selenium deeply within its matrix and retain its structural integrity comprising the steps of:

a. preparing a first single aqueous solution containing uniformly distributed throughout dissolved water-soluble salts XM and YM of an active cation and of a carrier cation, respectively:
   where X is a cation of an active material and is selected from the group consisting of iron and cobalt;
   where Y is a cation of a structurally adequate carrier forming a high surface area material and is aluminum; and
   where M is an anion of a water-soluble salt of X and Y and is selected from the group consisting of nitrate and halide;
b. reacting said dissolved salts in said first single aqueous solution with a basic ZN in aqueous solution to form insoluble co-precipitates XN and YN and a by-product ZM; said ZN being present in an amount greater than the stoichiometric amount required for complete reaction in order to form uniformly dispersed insoluble co-precipitates:
   where Z is a cation forming a water-soluble basic material with N and forming a reaction product with the anion M that can be readily removed from said insoluble co-precipitates; and
   where N is an anion forming a water-soluble basic material with Z and forming insoluble co-precipitates with X and Y and is selected from the group consisting of carbonate and hydroxide;
c. drying said uniformly dispersed co-precipitates to remove the water therefrom;
d. removing said by-product from said uniformly dispersed co-precipitates;
e. comminuting the dried uniformly dispersed co-precipitates;
f. forming the comminuted uniformly dispersed co-precipitates into an aqueous slurry;
g. forming said slurry into particles of desired size and shape;
h. drying said particles; and
i. calcining in the presence of an oxidizing atmosphere the dried particles to incorporate oxygen atoms into the matrix and to achieve the requisite co-precipitated uniformly dispersed active and carrier material, hardness and surface area.

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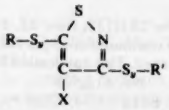
**3,896,050**

## LUBRICATING OIL ADDITIVES

**James A. White, Houston, Tex., assignor to Texaco Inc., New York, N.Y.**

**Filed July 5, 1974, Ser. No. 486,148**
**Int. Cl. C10m** *1/38, 3/32*
**U.S. Cl. 252—47.5** **15 Claims**

1. A lubricating oil composition comprising a blend of
a. a major amount of a lubricating oil substrate and
b. a minor corrosion inhibiting amount of the composition



wherein:
R and R' = $C_1$ to $C_{20}$ alkyl and may be the same or different
Y = 2 or more
X = CN or COOR'' or R''' wherein R'' is $C_1$ to $C_{20}$ alkyl or alkyl substituted with oxygen or sulfur and R''' is $C_1$ to $C_{20}$ alkyl or cycloalkyl

3,896,051

## METHOD OF REACTIVATION OF RANEY NICKEL

Shunsuke Mabuchi; Kenji Tsuzuki; Hideaki Matsunaga; Sadami Shimizu, and Makoto Sumita, all of Shin-Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Dec. 26, 1973, Ser. No. 427,683

Claims priority, application Japan, Dec. 25, 1972, 47-129219

Int. Cl. B01j *11/30*

U.S. Cl. 252—412 10 Claims

1. A method for the reactivation of a poisoned Raney nickel catalyst modified by a small amount of metal from the group consisting of copper, chromium and iron which is used for the hydrogenolysis of inorganic peroxide polymer to form a diol product which comprises treating said catalyst with a 0.1 – 5 N aqueous or lower alcohol solution of an activating reagent selected from the group consisting of ammonia, an alkaline earth metal hydroxide, carbonate or carboxylate having 1 – 4 carbon atoms and an alkali metal carbonate or carboxylate having from 1 – 4 carbon atoms at 20°–200°C under an atmosphere of hydrogen or nitrogen from 2 to 8 hours, and separating said treated catalyst from said aqueous or lower alcohol solution.

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3,896,052

## COCATALYST SYSTEM FOR TRIMERIZING POLYISOCYANATES

Robert J. Lockwood, East Haven; Harold E. Reymore, Jr., Wallingford, and Edward J. Thompson, Watertown, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

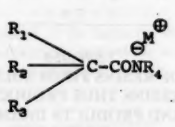
Filed Jan. 30, 1974, Ser. No. 437,780

Int. Cl. C08f *47/10*; C08g *22/44*

U.S. Cl. 252—431 C 13 Claims

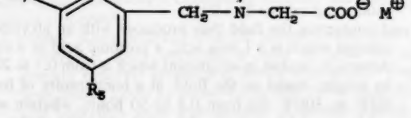
1. A cocatalyst system for the trimerization of a polyisocyanate consisting essentially of:

a. from about 33 to about 67 mole percent of an amide salt having the formula

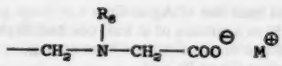


wherein M is an alkali metal, $R_1$, $R_2$, and $R_3$ can be the same or different and are selected from the group consisting of H, lower alkyl, aryl, aralkyl, and cycloalkyl, and $R_4$ is selected from the group consisting of lower alkyl and aryl; and

b. from about 33 to about 67 mole percent of a glycine salt having the formula



wherein M is an alkali metal, $R_5$ is selected from the class consisting of hydrogen and alkyl having from one to 12 carbon atoms, inclusive, $R_6$ is selected from the class consisting of hydrogen, alkyl having from one to 12 carbon atoms, inclusive, and $—CH_2—COO^- M^+$, and $R_7$ is selected from the class consisting of hydrogen and the group



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3,896,053

## NICKEL-CONTAINING HYDROGENATION CATALYSTS FOR THE SELECTIVE HYDROGENATION OF FATS AND OILS

Franz Josef Broecker; Juergen Heners, both of Ludwigshafen; Laszlo Marosi, Speyer; Matthias Schwarzmann, Limburgerhof, and Peter Rudolf Laurer, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Claims priority, application Germany, June 10, 1972, 2228332

Filed June 7, 1973, Ser. No. 367,949

Int. Cl. B01j *11/22*

U.S. Cl. 252—466 J 2 Claims

1. A catalyst for the selective hydrogenation of fats and fatty acids, which has been prepared by calcining a compound of the formula

$$Me_6^{(2+)}Al_2(OH)_{16}.CO_3.4H_2O$$

in which $Me^{(2+)}$ is nickel, copper or cobalt, and reducing said calcined compound with hydrogen at temperatures ranging from 200° to 600°C and in which said compound has been prepared from an aqueous solution, which contained 1M to 2M solutions of the divalent metal salts and of trivalent aluminum salt, by precipitating with a 1M to 2M alkali metal carbonate or bicarbonate solution at temperatures ranging from 50° to 95°C and a pH of from 4.0 to 8.5 and then washing, filtering and drying to obtain said compound.

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3,896,054

## HIGH ADHESION METALLIZATIONS

John Robert Larry, Youngstown, N.Y., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 231,375, March 2, 1972, abandoned. This application Oct. 9, 1973, Ser. No. 404,796

Int. Cl. C03c *3/10*, *5/02*; H01b *1/02*

U.S. Cl. 106—1 9 Claims

1. In metallizations useful for printing silver or silver/palladium conductors on substrates comprising finely divided silver or silver/palladium powder and finely divided inorganic binder, improved metallizations wherein the inorganic binder consists essentially of, by weight,

5–22% PbO
1–5% CaO
0.7–3% $Al_2O_3$
0.7–2.5% $B_2O_3$
5–20% $SiO_2$
50–85% $Bi_2O_3$,

said metallizations being useful for producing conductors of enhanced soldering characteristics and improved adhesion to the substrate upon thermal aging versus compositions employing other inorganic binders.

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3,896,055

## PYROCHLORE-RELATED OXIDES CONTAINING COPPER AND/OR SILVER AND RESISTOR COMPOSITIONS THEREOF

Robert Joseph Bouchard, and Donald Burl Rogers, both of Wilmington, Del., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 26, 1973, Ser. No. 326,955

Int. Cl. H01b *1/08*

U.S. Cl. 252—521 16 Claims

1. Electrically conductive polynary oxides of pyrochlore-related crystal structure having the formula

$$M_xM'_{2+x}M''_2O_{7+z}$$

wherein:

1. M is at least one of Ag or Cu;
2. M′ is Bi or a mixture of at least one half Bi plus up to one half of one or more cations from among
   a. bivalent Cd or Pb and
   b. trivalent Y, Tl, In and rare earth metals of atomic number 57–71, inclusive;
3. M″ is at least one of
   a. Ru,
   b. Ir, and
   c. a mixture of at least three-fourths of at least one of Ru and Ir and up to one-fourth of at least one of Pt, Ti and Rh;
4. $x$ is in the range 0.10 to 0.60 and
5. $z$ is in the range 0.10 to 1.0, and is equivalent to the sum of monovalent cations M and half of divalent cations in the polynary oxide.

**9.** A powder composition comprising the polynary oxides of Claim 1 and dielectric material, useful for producing low resistivity resistors on dielectric substrates.

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**3,896,056**

## BUILT DETERGENT COMPOSITION

**Lawrence Benjamin, and Daniel S. Connor, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 100,546, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 98,158, Dec. 14, 1970, abandoned. This application Mar. 2, 1973, Ser. No. 337,333**

**Int. Cl.[2] C11B** *3/065*

**U.S. Cl. 252—539** **8 Claims**

1. A built detergent composition consisting essentially of:
   a. from 8 to 50% by weight of an organic surface-active agent selected from the group consisting of anionic; nonionic; zwitterionic; and ampholytic detergents; and mixtures thereof;
   b. from 70 to 25% by weight of an inorganic precipitating builder selected from the group consisting of a water-soluble carbonate, silicate and aluminate salt and mixtures thereof; and
   c. from 0.1 to 10% by weight of a precipitation modifier selected from the group consisting of:
      mellitic acid, xylaric acid, cyclopentane-cis, cis, cis-tetracarboxylate acid, addition product of polyvinylethylether (MW 4000) & 20% maleic acid, addition product of polyethyleneglycol (MW 1000) diacetate & 10% maleic acid, addition product of polyethyleneglycol (MW 600 ) diacetate &
      40% maleic acid, addition product of pentaerythritol ethylene oxide (MW 4000) tetraacetate & 40% maleic acid, addition product of polyethylene oxide (20 molecules) sperm oil alcohol acetate & 32.5% maleic acid, ethylenetetracarboxylic acid, polyallylsuccinate, hexapotassium cyclopentadienide pentacarboxylate, 2,3,4,5-tetrahydrofuran-cis, cis, cis-tetracarboxylic acid, carboxymethyl starch degree of substitution 0.8, carboxymethyl starch degree of substitution 1.7, polycarboxymethylated dicarboxyl starch degree of substitution approx. 2.8, sodium salt of carboxymethyl cellulose degree of substitution 2.0, carboxymethyl dextran degree of substitution 2.0, propylene/maleic acid copolymer, diacid cellulose, carboxymethylated sodium alginate, sodium polymaleate (mol. weight 2500), sodium alginate, 70:30 acrylic acid/hydroxyethylmaleate copolymer, polyvinyl sulfate, hexasodium 1,1,3,3,5,5-pentane hexacarboxylate and mixtures thereof

whereby the weight ratio of said builder to said modifier is in the range from 1000:1 to 1:1 and the weight ratio of said organic surface-active agent to said builder is in the range from 20:1 to 1:20.

**3,896,057**

## COMPOSITE OLEFIN SULFONATE

**Kenneth L. Lindsay; Gerhard O. Kuehnhanss, and Melvin E. Tuvell, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.**

**Continuation-in-part of Ser. No. 760,993, Sept. 19, 1968. This application Oct. 13, 1972, Ser. No. 297,462**

**Int. Cl. C11d** *1/12*

**U.S. Cl. 252—555** **7 Claims**

1. The composite olefin sulfonate product obtained by sulfonating with gaseous uncomplexed $SO_3$ a mixture of olefins having from about 12 to about 16 carbon atoms per molecule and the following mol percent composition:
   vinyl olefins — from about 40 to about 60 percent
   internal olefins — from about 10 to about 35 percent
   vinylidene olefins — from about 5 to about 40 percent,

saponifying the sulfonated olefins with NaOH, and removing the unsaponified material from the saponified mixture.

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**3,896,058**

## POLYPHOSPHAZENES CONTAINING THE $CF_3CHFCF_2CH_2O$- GROUP

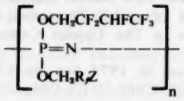
**Kennard A. Reynard, Mentor; Arthur H. Gerber, University Heights, and Selwyn H. Rose, Beachwood, all of Ohio, assignors to Horizons Incorporated, Cleveland, Ohio**

**Filed Dec. 20, 1973, Ser. No. 426,527**

**Int. Cl.[2] C08G** *73/00, 79/02*

**U.S. Cl. 260—2 P** **4 Claims**

1. Poly(fluoroalkoxyphosphazenes) soluble in dimethylformamide and represented by the general formula



wherein the $ZR_f$ groups are selected from $CF_3CHFCF_2$— or from groups which contain from 1 to 4 carbon atoms which are fluorinated and in the latter groups Z is F or H, and the amount of $CF_3CHFCF_2$ groups may be present in amounts up to 100%, and n is an integer from 10 to 50,000.

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**3,896,059**

## PRODUCTION OF RESINS FROM SOLUBILIZED SCRAP RUBBER, THE RESINS THUS PRODUCED AND RUBBER COMPOUNDS AND PRODUCTS INCORPORATING THE RESINS

**Lynn B. Wakefield; Grant Crane, and Edward Leo Kay, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio**

**Filed Feb. 5, 1974, Ser. No. 439,774**

**Int. Cl.[2] C08J** *11/00;* **C08C** *19/08*

**U.S. Cl. 260—2.3** **8 Claims**

1. The method of producing a resin by the successive steps of
   heating solid scrap rubber in contact with a hydrocarbon liquid at 400° to 800°F. for 0.1 to 50 hours to convert the solid scrap rubber to a fluid,
   and contacting the fluid thus produced with an alkylation catalyst which is a Lewis acid, a protonic acid or a condensation catalyst in an amount which is from 0.1 to 20% by weight, based on the fluid, at a temperature of from 60°F. to 300°F. for from 0.5 to 50 hours, wherein said solid scrap rubber is natural or synthetic rubber or blends of the two, and said synthetic rubber is a homopolymer of butadiene, isoprene, chloroprene or piperylene, or a copolymer of them with each other or with styrene, alpha-methylstyrene, divinylbenzene, ethylene, propylene, isobutylene, or an ethylenically unsaturated carboxylic acid ester or nitrile.

## 3,896,060
## PROCESS FOR FORMING FOAMED UNSATURATED POLYESTER RESIN PRODUCTS WHILE UNDER A PARTIAL VACUUM

**Mark Plunguian, 461 W. Chestnut Hill Rd., Newark, Del. 19713, and Charles E. Cornwell, 710⁴ Marlan Dr., Alexandria, Va. 22307**

**Continuation-in-part of Ser. No. 449,593, March 11, 1974. This application Dec. 9, 1974, Ser. No. 530,683**

**Int. Cl.² C08J** *9/14, 9/30*

**U.S. Cl. 260—2.5 N** **8 Claims**

1. A process for producing a cured cellular structure which process comprising mixing (a) an unsaturated polyester formed by condensing at least one dicarboxylic acid containing $\alpha,\beta$-ethylenic unsaturation with a dihydric alcohol, with (b) an $\alpha,\beta$-ethylenically unsaturated copolymerizable monomer, and incorporating (c) gaseous cells derived from air into the mixture, foaming this mixture by creating a partial vacuum of 180 to 50 Torr, and effecting the copolymerization of (a) and (b) while under this partial vacuum and while the mixture is in the foamed state.

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## 3,896,061
## SEMI-PERMEABLE MEMBRANES, THEIR PREPARATION AND THEIR USE

**Hiroshi Tanzawa; Yoshitada Sakai, both of Kamakura; Takao Matsushita, Yuushudainishi; Yoshishige Fujii, Otsu; Kouji Sugita, Otsu, and Haruki Maekawa, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Aug. 7, 1973, Ser. No. 386,388**

**Claims priority, application Japan, Aug. 16, 1972, 47-81408; Feb. 17, 1973, 48-188779**

**Int. Cl. C08f** *47/10*

**U.S. Cl. 260—2.5 M** **6 Claims**

1. A hydrogel semi-permeable membrane which is comprised of isotactic polymethylmethacrylate and syndiotactic polymethylmethacrylate, having a molecular weight of more than 100,000, wherein the tacticity of the mixture of said isotactic polymethylmethacrylate and said syndiotactic polymethylmethacrylate is within the range of

$$0.1 < I/S < 10$$

and

$$I + S > H$$

wherein I is the percent of the isotactic structures expressed by triad, S is the percent of syndiotactic structures expressed by triad, and the means molecular weight of the polymers is more than 100,000.

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## 3,896,062
## POLYETHER URETHANE FOAM

**Edward Lewis Morehouse, Danbury, Conn., assignor to Union Carbide Corporation, New York, N.Y.**

**Division of Ser. No. 305,713, Nov. 13, 1972, Pat. No. 3,839,384. This application July 10, 1974, Ser. No. 487,192**

**Int. Cl. C08g** *22/46*

**U.S. Cl. 260—2.5 AH** **31 Claims**

1. A process for producing high resilience polyether urethane foam, said process comprising foaming and reacting a mixture comprising:

I. organic polyol selected from the group consisting of (A) a polyether triol containing at least 40 mole per cent primary hydroxyl groups and having a molecular weight from about 2,000 to about 8,000 and (B) a mixture of said polyether triol and another polyether having an average of at least two hydroxyl groups, said polyether triol of said mixture amounting to at least 40 weight percent of the total polyol content;

II. organic polyisocyanate, said organic polyol and said polyisocyanate being present in the mixture in a major amount and in the relative amount of required to produce the urethane;

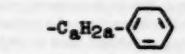
III. blowing agent in a minor amount sufficient to foam the reaction mixture;

IV. a catalytic amount of catalyst for the production of the urethane; and

V. a foam stabilizing amount of aralkyl modified siloxane oil having the average formula

$$(X)_zR_{3-z}SiO(R_2SiO)_x[(X)(R)SiO]_ySiR_{3-z}X_z$$

wherein $x$ has a value of 2 to 8 inclusive; $y$ has a value of 0 to 6 inclusive; $z$ has a value of 0 to 1 inclusive; R is a lower alkyl or phenyl radical; and X is an aralkyl radical of the formula



where $a$ has a value of 2 or 3; said siloxane containing at least one of said aralkyl radicals and having a viscosity in the range of about 4 to about 40 centistokes at 25°C.

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## 3,896,063
## PROCESS FOR PRODUCING VINYLIDENE CHLORIDE/VINYL CHLORIDE COPOLYMERS

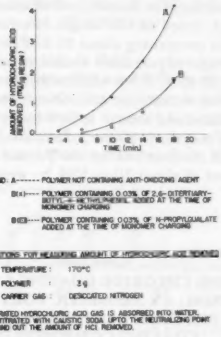
**Yasushi Toyoda, and Hidetora Kashio, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 146,622, May 25, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,413**

**Claims priority, application Japan, May 28, 1970, 45-45836**

**Int. Cl. C08f** *19/14*

**U.S. Cl. 260—23 XA** **2 Claims**


AMOUNT OF HYDROCHLORIC ACID REMOVED (ml/g RESIN)
TIME (min)
A
B
LEGEND: A------ POLYMER NOT CONTAINING ANTI-OXIDIZING AGENT
B(1)---- POLYMER CONTAINING 0.05% OF 2,6-DITERTIARY-BUTYL-4-METHYLPHENOL ADDED AT THE TIME OF MONOMER CHARGING
B(2)---- POLYMER CONTAINING 0.03% OF N-PROPYLGALLATE ADDED AT THE TIME OF MONOMER CHARGING
CONDITIONS FOR MEASURING AMOUNT OF HYDROCHLORIC ACID REMOVED
TEMPERATURE : 170°C
POLYMER : 3 g
CARRIER GAS : DESICCATED NITROGEN
GENERATED HYDROCHLORIC ACID GAS IS ABSORBED INTO WATER, AND TITRATED WITH CAUSTIC SODA UNTIL THE NEUTRALIZING POINT TO FIND OUT THE AMOUNT OF HCl REMOVED.

1. In a process for producing an odorless copolymer of vinylidene chloride and vinyl chloride having improved heat-stability by suspension-polymerizing a monomer mixture composed of 65 to 95 parts by weight of a vinylidene chloride monomer and 35 to 5 parts by weight of vinyl chloride at a polymerization temperature of from 10° to 80°C using an oil-soluble-polymerization initiator, the improvement which consists of adding to said reaction system at the time of polymerization, a polymerization stabilizer selected from the group consisting of 2,6-ditertiarybutyl-4-methylphenol and normal-propyl-gallate in a quantity ranging from 0.10 to 0.005 part by weight with respect to 100 parts by weight of the vinylidene chloride and vinyl chloride monomers.

3,896,064

## VEHICLES FOR PRINTING INK

Hitoshi Koishi, Tokyo, and Yoshihiro Ishida, Kawaguchi, both of Japan, assignors to Tokyo Printing Ink Mfg. Co., Ltd., Japan

Filed Apr. 2, 1973, Ser. No. 347,177
Claims priority, application Japan, May 17, 1972, 47-048175
Int. Cl. C08c *9/18*; C08d *3/40*
U.S. Cl. 260—24 6 Claims

1. In a vehicle for a printing ink composed of a resin with or without a solvent, the improvement wherein the resin is prepared by the addition reaction of a petroleum resin with at least one unsaturated polybasic acid or anhydride thereof in an amount from 0.5 to 3 mols of acid per mol of resin and the subsequent reaction of the resulting addition product with rosin or rosin derivatives containing polyamines in an amount from 0.3 to 0.8 mols based on the amount of said acid in said resin.

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3,896,065

## SUBSTRATES COATED WITH STABLE PIGMENTED ETHYLENE COPOLYMER DISPERSIONS

Joseph Edward Reardon, and Vernon Clare Wolff, Jr., both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 757,096, Sept. 3, 1968, abandoned. This application Nov. 20, 1970, Ser. No. 91,568
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 AV 2 Claims

1. An aqueous dispersion comprising: about 50% by weight, based on the weight of solids, of a pigment mixture of about 20 to 35% by weight, based on the total weight of pigment mixture, of clay and about 65 to 80% by weight, based on the total weight of pigment mixture, of titanium dioxide; about 50% by weight, based on the weight of solids, of a polymeric pigment binder comprising about 80 to 99% by weight, based on the total weight of polymeric binder, of an ethylene copolymer of about 85 to 97% by weight ethylene and about 15 to 3% by weight of methacrylic acid, about 3 to 75% of the acid groups neutralized and about 1 to 20% by weight, based on the total weight of polymeric binder, of a hydrocarbon wax having a melting point of about 143° to 150°F., said dispersion having a solids content of about 30 to 65% by weight.

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3,896,066

## VINYLIDENE CHLORIDE COATING COMPOSITION CONTAINING AN AROMATIC POLYESTER AND POLYESTER SUBSTRATES COATED WITH THE COATING COMPOSITION

Ralph Oliver Ranck, Richmond, Va., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 356,442, May 2, 1973, abandoned. This application July 6, 1973, Ser. No. 377,087
Int. Cl. C08f *29/20*, *45/32*, *45/52*
U.S. Cl. 260—28.5 AV 11 Claims

1. A volatile organic solvent solution of a heat-sealable tack-free coating composition comprising

1. a copolymer of vinylidene chloride and at least one other ethylenically unsaturated monomer copolymerizable therewith, said copolymer containing at least 80% by weight of vinylidene chloride,
2. about 0.1 to 6% by weight, based on said vinylidene chloride copolymer, of a linear film-forming polyester resin having a molecular weight of at least about 500 prepared by condensing a glycol and a polyfunctional acid, at least 70% by weight of said polyfunctional acid being an aromatic polyfunctional acid, and
3. wax and particulates.

3,896,067

## PROCESS FOR PREPARING POLYMER COMPOSITIONS HAVING SUBSTANTIAL ADHESIVE PROPERTIES

Yujiro Kosaka; Masaru Uemura; Tokio Fujiki; Masatoshi Kimura, and Mitsutaka Saito, all of Shin Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Oct. 2, 1973, Ser. No. 402,919
Claims priority, application Japan, Oct. 7, 1972, 47-100304The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 AV 10 Claims

1. An adhesive polymer composition, which comprises:

a grafted copolymer wherein a monomer mixture of an alkyl acrylate and maleic anhydride is grafted onto 95 – 20 parts by weight of a mixture of an ethylene-vinyl acetate copolymer containing 5 – 70 wt.% vinyl acetate and a hydrocarbon base, wherein the ratio of said hydrocarbon base to said ethylene-vinyl acetate copolymer is 1 : 0.1 – 10; and

a copolymer formed by the polymerization of said monomer mixture, wherein the content of said monomer mixture in said polymer composition is 5 - 80 parts by weight.

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3,896,068

## PRINTABLE ANTI-BLOCKING RESINOUS BLOCK COPOLYMER

John H. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 15, 1974, Ser. No. 460,936
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 B 11 Claims

1. A composition comprising a resinous block copolymer of a monovinyl-substituted aromatic compound and a conjugated diene;

0.1 to 20 weight percent based on the weight of said block copolymer of an anti-block agent; and

0.1 to 1 weight percent based on the weight of said block copolymer of a normally solid crystalline olefin polymer.

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3,896,069

## HOT MELT COMPOSITION HAVING IMPROVED SOFTENING TEMPERATURE

Yujiro Kosaka; Hitoshi Kuroki; Nobuhiro Echida; Kanji Otomo, and Masaru Uemura, all of Yokohama, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed May 28, 1974, Ser. No. 474,071
Claims priority, application Japan, May 26, 1973, 48-58977
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 AV 6 Claims

1. In a hot melt composition which comprises an ethylene-vinylacetate copolymer having a vinylacetate content of 10 – 45 weight percent and melting index of 1 – 1000 g/10 min. and at least one additive selected from the group consisting of a tackifier, wax and asphalt, the improvement which comprises: admixing an oxidized low molecular weight polypropylene having an acid value of 1 – 20, which is prepared by oxidizing polypropylene having an average molecular weight of 500 – 10,000 in a ratio of 1/100 – 60/10 by weight with said ethylene-vinylacetate copolymer.

## 3,896,070
## DISPERSION OF CROSS-LINKABLE ACRYLIC RESIN WITH AMINO-ALDEHYDE

**Peter Tümmler, and Herbert Zima, both of Graz, Austria, assignors to Vianova-Kunstharz A.G., Vienna, Austria**

**Filed July 2, 1974, Ser. No. 485,273**

**Claims priority, application Austria, July 3, 1973, 5863/73; July 3, 1973, 5864/73**

**Int. Cl. C08f** *15/40*; **C08g** *37/32*

**U.S. Cl. 260—29.4 UA** **8 Claims**

1. Heat hardenable coating compositions comprising -

1. 60 – 95 % by weight of a polymer dispersion prepared by emulsion polymerization of -
   - 25 – 35 % by weight of butylmethacrylate
   - 10 – 25 % by weight of ethylhexylacrylate and/or n-butylacrylate
   - 10 – 20 % by weight of methylmethacrylate
   - 10 – 20 % by weight of styrol
   - 1 – 3 % by weight of methacrylic acid and/or acrylic acid
   - 10 – 25 % by weight of polypropyleneglycol monomethacrylate and/or polyethyleneglycol monomethacrylate,
2. 5 – 40 % by weight of a water-soluble or water-dispersible amine-formaldehyde-condensation product, the methylol groups of which are partially or completely etherified with monoalcohols, and
3. 0 – 150 % by weight of the total solids of (1) and (2) of a pigment paste of -
   a. 4 – 70 % by weight of a pigment and/or filler, and
   b. 30 – 96 % by weight of a pigment wetting agent.

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## 3,896,071
## STORAGE STABLE AQUEOUS DISPERSION OF TETRAFLUORETHYLENE POLYMER

**Robert Victor Poirier, Vienna, W. Va., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.**

**Continuation-in-part of Ser. No. 301,537, Oct. 27, 1972, abandoned. This application July 10, 1974, Ser. No. 487,266**

**Int. Cl. C08f** *45/24*

**U.S. Cl. 260—29.6 F** **4 Claims**

1. An aqueous dispersion consisting essentially of water; tetrafluoroethylene polymer particles wherein the polymer is tetrafluoroethylene homopolymer or a copolymer of tetrafluoroethylene with up to 35% by weight based on weight of copolymer of another copolymerizable ethylenically unsaturated monomer; a nonionic surfactant dissolved in said water, present in an amount of about 1 to 6 % by weight based on weight of tetrafluoroethylene polymer; and an essentially hydrophilic alkylene oxide polymer having a molecular weight of at least 5000 dissolved in said water, said alkylene oxide polymer being present in an amount of between about 1 to 6 % by weight based on weight of tetrafluoroethylene polymer.

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## 3,896,072
## PROCESS OF MAKING AQUEOUS CO-POLYMER DISPERSION AND DISPERSION THEREFOR

**Peter Tummler, and Herbert Zima, both of Graz, Austria, assignors to Vianova-Kunstharz A.G., Vienna, Austria**

**Filed July 2, 1974, Ser. No. 485,274**

**Claims priority, application Austria, July 3, 1973, 5863/73; July 3, 1973, 5864/73**

**Int. Cl. C08f** *1/13*, *45/26*

**U.S. Cl. 260—29.6 TA** **11 Claims**

1. Process for producing aqueous cross-linking co-polymer dispersions for stoving metal finishes comprising emulsion co-polymerizing monomers as follows
   - 25 – 35 % by weight of butylmethacrylate
   - 10 – 25 % by weight of ethylhexylacrylate and/or n-butylacrylate
   - 10 – 20 % by weight of methylmethacrylate
   - 10 – 20 % by weight of styrol
   - 1 – 3 % by weight of methacrylic acid and/or acrylic acid
   - 10 – 25 % by weight of polypropylene glycolmonomethacrylate and/or polyethylene glycolmonomethacrylate

the total monomer content, within said ranges, being 100 %, in the presence of an anionic emulsifier.

10. An aqueous cross-linkable dispersion which is a co-polymer prepared by emulsion co-polymerizing monomers as follows
   - 25 – 35 % by weight of butylmethacrylate
   - 10 – 25 % by weight of ethylhexylacrylate and/or n-butylacrylate
   - 10 – 20 % by weight of methylmethacrylate
   - 10 – 20 % by weight of styrol
   - 1 – 3 % by weight of methacrylic acid and/or acrylic acid
   - 10 – 25 % by weight of polypropylene glycolmonomethacrylate and/or polyethylene glycolmonomethacrylate

the total monomer content, within said ranges, being 100 %, in the presence of an anionic emulsifier.

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## 3,896,073
## AQUEOUS DISPERSIONS OF FILM-FORMING

**Thomas Woods Smith, Ann Arbor, Mich., assignor to The Lubrizol Corporation, Cleveland, Ohio**

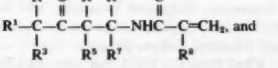
**Continuation-in-part of Ser. No. 62,677, Aug. 10, 1970, abandoned. This application Nov. 28, 1972, Ser. No. 310,067**

**Int. Cl. C08f** *45/24*

**U.S. Cl. 260—29.6 RW** **11 Claims**

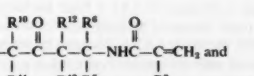
1. A composition which is fluid at room temperature and which comprises a substantially stable dispersion in water of a graft polymer wherein the base polymer is at least one vinyl acetate, alkyl acrylate or alkyl methacrylate homopolymer or interpolymer and the grafted units are derived from at least one polymerizable component selected from the group consisting of:

A. Substituted acrylamides of the formula



B. Water-soluble hydroxyalkylated compositions consisting essentially of

X. compounds of the formula



Y. condensation dimers and trimers of X; wherein

each of $R^1$, $R^2$, $R^3$, $R^4$, $R^5$, $R^6$ and $R^7$ is hydrogen or a lower alkyl or substituted lower alkyl radical, at least one of $R^1$, $R^2$, $R^3$, $R^4$, and $R^5$ being hydrogen;

$R^8$ is hydrogen, halogen or a lower alkyl or substituted lower alkyl radical;

each of $R^9$, $R^{10}$, $R^{11}$, $R^{12}$ and $R^{13}$ is hydrogen, a lower alkyl or substituted lower alkyl radical, a hydroxyalkyl radical having not more than 4 carbon atoms, or an alkoxy derivative of said hydroxyalkyl radical, at least one being a hydroxyalkyl radical or alkoxy derivative thereof.

3,896,074

## ALKYLACRYLATE-ALKANEDIOL METHACRYLATE INTERPOLYMERS AND POUR DEPRESSED COMPOSITIONS THEREOF

Roy Isamu Yamamoto, Wappingers Falls, and George S. Saines, Fishkill, both of N.Y., assignors to Texaco, Inc., New York, N.Y.

Division of Ser. No. 309,585, Nov. 24, 1972, Pat. No. 3,817,866. This application Dec. 6, 1973, Ser. No. 422,218

Int. Cl. C08f 15/16

U.S. Cl. 260—80.81 2 Claims

1. A cross-linked interpolymer of an n-alkylacrylate mixture and alkanediol dimethacrylate of a molecular weight between about 3000 and 100,000 (membrane osmometry) wherein the alkanediol dimethacrylate moiety is of from 10 to 18 carbons, said n-alkyl is at least 18 carbons and at least 70 wt. % of said n-alkyl in said mixture is of from 20 to 24 carbons consisting of between about 2 and 65 wt. % $C_{20}$, between about 18 and 65 wt. % $C_{22}$ alkyl and between about 8 and 35 wt. % $C_{24}$ alkyl, said interpolymer having a weight ratio of the n-alkylacrylate mixture moiety to dimethacrylate moiety of between about 99.5:0.5 to 95:5.

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3,896,075

## FRICTION MATERIALS

John William Longley, Bradford, England, assignor to BBA Group Limited, Cleckheaton, England

Filed Nov. 3, 1972, Ser. No. 303,364

Claims priority, application United Kingdom, Nov. 4, 1971, 51434/71

Int. Cl.[2] C08K 3/22, 3/36; C08L 67/10

U.S. Cl. 260—38 5 Claims

1. A friction material for friction engaging mechanisms comprising by weight

40 to 60% of basalt fiber,

8 to 15% of thermosetting resin binder, the balance being at least one compound selected from the group consisting of fillers and additives.

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3,896,076

## ADHESIVE COMPOSITION FOR FLEXIBLE PRINTED CIRCUIT AND METHOD FOR USING THE SAME

Tsutomu Watanabe; Shigenori Yamaoka, and Koichi Tanaka, all of Yokohama, Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,708

Claims priority, application Japan, June 20, 1973, 48-68802

Int. Cl. C08g 51/04

U.S. Cl. 260—40 R 8 Claims

1. An adhesive composition for a flexible printed circuit comprising a mixture of (A) a high molecular weight linear polyester resin obtained by poly-condensation of dibasic acids and divalent alcohols; (B) 1–20 parts by weight, per 100 parts by weight of said polyester resin, of a polyisocyanate compound having at least two isocyanate groups in the molecule selected from the group consisting of a polyisocyanate having such groups as alkyl, aryl and aralkyl, and a reaction product of tolylene diisocyanate and trimethylol propane; and (C) 2 to 50 parts by weight, per 100 parts by weight of said polyester resin, of a B-stage epoxy resin containing substantially no free curing agent and having a number average molecular weight of from 1,000 to 10,000, and obtained by reacting a compound having at least two epoxy groups in the molecule and the epoxy equivalent of from 100 to 4,000 with a compound containing at least two active hydrogen atoms in an equivalent ratio of from 0.2 to 1.0 mole of active hydrogen compound to 1.0 mole of epoxy compound.

3,896,077

## UNDERWATER ADHESIVE

Fred Leonard, 7713 Beech Tree Rd., Bethesda, Md. 20034, and George Brandes, 30 Sidonia Ave., Coral Gables, Fla. 33134

Continuation of Ser. No. 857,538, Sept. 12, 1969, Pat. No. 3,607,542, which is a continuation-in-part of Ser. No. 699,062, Jan. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 586,316, Oct. 10, 1966, abandoned. This application Nov. 30, 1970, Ser. No. 93,903

Int. Cl. C08f 45/04

U.S. Cl. 260—42.48 24 Claims

1. A composition having a paste-like consistency and containing, as essential ingredients, (*a*) at least one β-unsubstituted α-cyanoacrylic acid ester which is liquid at room temperature and atmospheric pressure, the α-cyanoacrylic acid ester consisting of the acyl group $H_2C{=}C(CN){-}CO{-}O{-}$ and a group a carbon atom of which is directly bound to the available bond of an oxygen atom of said acyl group, and (*b*) water-insoluble solid filler which is essentially inert with respect to the α-cyanoacrylic acid ester and insoluble therein, the filler being capable of forming a paste-like consistency with the α-cyanoacrylic acid ester and being present in the composition in an amount sufficient to form the paste-like consistency.

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3,896,078

## STABILIZATION OF POLYMERS CONTAINING POLY(ALKYLENE OXIDE) UNITS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont De Nemours & Company, Wilmington, Del.

Filed Dec. 18, 1972, Ser. No. 316,268

Int. Cl. C08f 45/60

U.S. Cl. 260—45.9 NC 10 Claims

1. A stabilized copolyester composition consisting essentially of a mixture of (a) a copolyether ester consisting of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula

I $$-OGO-\overset{O}{\overset{\|}{C}}R\overset{O}{\overset{\|}{C}}-$$

and said short chain units being represented by the formula

II $$-ODO-\overset{O}{\overset{\|}{C}}R\overset{O}{\overset{\|}{C}}-$$

where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a molecular weight of about 400–6000 and a carbon to oxygen ratio of about 2.0–4.3; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid or dicarboxylic acid ester having a molecular weight less than about 300 and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; provided said short-chain ester units amount to about 15–95% by weight of said copolyester (b) an effective concentration of amide linkage containing material which on hydrolysis yields primary amino groups and carboxyl groups and (c) an effective amount of an antioxidant.

## 3,896,079
## IMINOXYORGANOSILANES

**Jean Boissieras; Louis Ceyzeriat, and Guy Poy, all of Lyon, France, assignors to Rhone-Poulenc, S.A., Paris, France**

**Continuation of Ser. No. 265,486, June 23, 1972, abandoned, which is a division of Ser. No. 84,149, Nov. 12, 1970, Pat. No. 3,697,568. This application Oct. 30, 1973, Ser. No. 411,153**

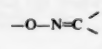
**Claims priority, application France, Nov. 12, 1969, 69.38761**

**Int. Cl. C08f** *11/04*

**U.S. Cl. 260—46.5 G** **10 Claims**

1. An elastomer forming composition comprising at least one polydiorganosiloxane terminated at each end of the chain by a hydroxy, alkoxy, amino, aminoxy, iminoxy or acyloxy group and, as cross-linking agent, at least one silane of the general formula:

wherein R represents an unsubstituted hydrocarbon radical, a halogen substituted monovalent hydrocarbon radical or a nitrile substituted monovalent hydrocarbon radical, one of Y and Q represents a



radical and the other of Y and Q represents a —O—$(DO)_nR'''$ radical, and $a$ represents a positive number in the range 1 to 2 inclusive; each symbol R′ independently represents a monovalent hydrocarbon radical, each symbol R″ independently represents hydrogen or an alkyl radical containing 1–5 carbon atoms or, together with R′ represents a divalent hydrocarbon radical, each symbol R‴ independently represents a monovalent aliphatic hydrocarbon radical having 1–4 carbon atoms, each symbol D independently represents an alkylene radical having 1–8 carbon atoms and $n$=0, 1, 2 or 3.

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## 3,896,080
## LIQUID HARDENERS FOR LIQUID EPOXY RESINS, MANUFACTURING METHOD AND USE

**Silvio Vargiu, Sesto S. Giovanni; Renato Berti, Milan, and Mario Pitzalis, Arcore, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy**

**Filed Sept. 20, 1973, Ser. No. 399,006**

**Claims priority, application Italy, Sept. 20, 1972, 29429/72**

**Int. Cl. C08g** *30/14*

**U.S. Cl. 260—47 EN** **5 Claims**

1. Liquid compositions curable at temperatures of from room temperature down to −5°C., comprising a liquid 1,2-epoxy resin, which can be synthesized from the reaction of a halohydrin and a polyfunctional phenol, and about 20–60 weight percent, based on the liquid 1,2-epoxy resin, of a liquid hardener comprising the reaction product at high temperature of:

a. an aromatic polyamine,

b. at least one hydroxy compound selected from the group consisting of:

polyalkylene glycols,

furan alcohols and their polymers selected from the group consisting of furfuryl alcohol,

tetrahydrofurfuryl alcohol or a still curable furfuryl alcohol resin with a molecular weight of about 200 to 300, and

c. at least one acidic compound selected from the group consisting of:

phenols selected from the group consisting of phenol, o-chlorophenol, m-chlorophenol, p-chlorophenol, 2,4-dichlorophenol, o-nitrophenol, m-nitrophenol, and p-nitrophenol, and

carboxylic acids selected from the group consisting of formic, acetic, benzoic and salicyclic acid,

said hardener being formed under the following reaction conditions:

the aromatic polyamine (A) and the hydroxyl compound (B) are heated together for about 60 to 120 minutes to temperatures of about 90 to 130°C., the ratio of primary amino groups to hydroxyl groups being about 4:1 to 7:1, and

the product from the preceding reaction is heated with the acidic compound (c) for about 1 to 5 hours to temperatures of about 70° to 170°C, the ratio of the aromatic polyamine used to phenolic hydroxyl groups being about 1:1 to 3:1.

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## 3,896,081
## RAPID CURING RESIN COMPOSITIONS EMPLOYING AMINOPLAST CONDENSATION POLYMER MODIFIED WITH A DI-SUBSTITUTED BIS-ARYL AMINE

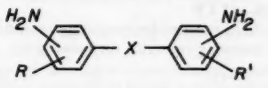
**Gene F. Baxter; Harlan G. Freeman, and George T. Tiedeman, all of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.**

**Division of Ser. No. 148,905, June 1, 1971, Pat. No. 3,784,516, which is a continuation-in-part of Ser. No. 821,961, May 5, 1969, abandoned. This application Oct. 23, 1973, Ser. No. 408,409**

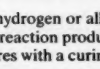
**Int. Cl.² C08G** *12/12, 12/32, 12/36, 12/38*

**U.S. Cl. 260—47 R** **48 Claims**

1. an amine-modified condensation polymer comprising the reaction product of an aminoplast containing reactive alkylol groups with a bis-aryl amine of the formula



wherein R and R′ are alkoxy, amino, hydrogen, hydroxyl, nitro, carboxyl or alkyl of 1 to 4 carbon atoms and X is —NH—, —O—, —C=C—, —S—, —S—S—, $-SO_2-$ or



where $Y_1$ and $Y_2$ are hydrogen or alkyl of 1 to 3 carbon atoms and $z$ is 0, 1 or 2; said reaction product being further reactable at ambient temperatures with a curing agent to form an insoluble, infusible product.

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## 3,896,082
## EPOXY POWDER COATINGS AND METHOD THEREFOR

**Leo Rensmann, Dorsten; Felix Schulde, Wulfen; Johann Obendorf, Dorsten, and Kurt Neubold, Bottrop, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany**

**Filed Oct. 4, 1973, Ser. No. 403,687**

**Claims priority, application Germany, Oct. 5, 1972, 2248776**

**Int. Cl. C08g** *30/16*

**U.S. Cl. 260—47 EN** **3 Claims**

1. Powder coating composition consisting essentially of a finely divided mixture of 1,2-epoxy compounds having at least one 1,2-epoxy group in the molecule and a lower softening point greater than 40°C., and from 2 to 10% by weight of an imidazole derivative having the formula

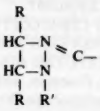
wherein

R is selected from the group of hydrogen, alkyl and aryl;

R′ is selected from the group of cycloalkyl, heterocycloalkyl and R;

R″ is selected from the group of alkylene and arylene and the foregoing substituted by alkyl and/or aryl; and

X is hydrogen or the radical



wherein R and R′ are as defined previously.

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**3,896,083**

## HETEROCYCLIC POLYMERS FROM TRIAMINOPYRADINE COMPOUNDS

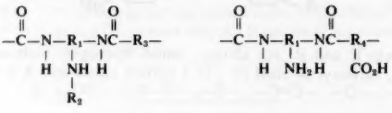
**Arthur H. Gerber, University Heights, Ohio, assignor to Horizons Incorporated, Cleveland, Ohio**

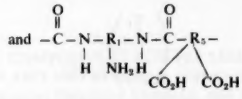
**Filed Mar. 4, 1974, Ser. No. 447,639**

**Int. Cl. C08g** *20/32*

**U.S. Cl. 260—47 CP** **10 Claims**

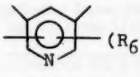
**1.** Precyclized polyamides consisting essentially of at least one of the following recurring formulae:





wherein

$R_1$ is a trivalent radical represented by the formula

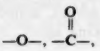


wherein one bond from either an α or γ position is bonded to the $-NHR_2$ or $-NH_2$ group; and all of the $R_1$ groups are not required to be the same in the polyamide;

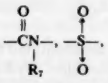
wherein $R_6$ represents a monovalent member selected from the group consisting of hydrogen, methyl, ethyl, propyl, butyl and pentyl, and both $R_6$ members are not required to be the same;

$R_2$ is a monovalent member selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, arylalkyl, substituted arylalkyl, aryl, substituted aryl, heterocyclic, substituted heterocyclic, in which said substituents are selected from the group consisting of methyl, phenyl, pyridyl, F(aromatic), Cl(aromatic), −CN, −COOH and its salts, $-COOC_6H_5$, $-SO_3H$ and its salts, −SH, thioaryl, thioalkyl, $-CH{=}CHC_6H_5$, and N,N-(dialkylamino); and not all of the $R_2$ groups are required to be the same in the polyamide;

$R_3$, $R_4$ and $R_5$ are divalent, trivalent, and tetravalent radicals respectively, selected from the following structural types: aliphatic, cycloaliphatic, alkenyl, perfluoroalkyl, perfluoropolyalkylene oxide, aromatic and heteraromatic, and inorganic/organic radicals, the carbocyclic and heterocyclic radicals having a single, multiple or fused ring structure, the multiple ring structures including polyarylenes with 2 to 9 aryl rings in which the aryl groups are bonded directly to each other or bridged by a divalent member selected from the group consisting of alkylene with up to 3 carbon atoms, perfluoroalkylene of 2 to 10 carbon atoms,



—S—,



—CH=CH—, 5- and 6- membered heteroaromatics containing at least one nitrogen atom, and mixtures thereof, and substituted aromatic radicals where the substituents are selected from lower alkyl, F, Cl, —CN, $-SO_3H$, and

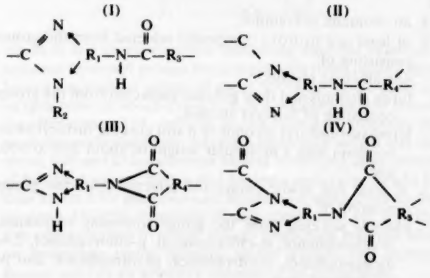
with the proviso that the —CN, $-SO_3H$, and

substituents are not ortho or peri to a

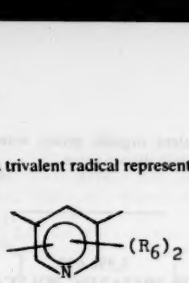
group; the inorganic/organic radicals consisting of ferrocenyl, carboranyl, and biaryls separated by at least one phosphorus atom or by at least one silanyl or siloxanyl group, and mixtures thereof; $R_7$ represents H, lower alkyl, or phenyl; and every $R_3$, $R_4$ and $R_5$ is not required to be the same as every other $R_3$, $R_4$ and $R_5$;

and acid salts thereof, of an acid selected from the group consisting of HCl, HBr, $H_3PO_4$, $CF_3COOH$, alkanesulfonic and perfluoroalkane sulfonic acids.

**3.** Cyclized heterocyclic polymers prepared by cyclodehydration of the polyamides and acid salts thereof of claim **1** and which contain recurring structural units consisting essentially of at least one of the following formulae:



in which $R_1$ is a trivalent radical represented by the formula



wherein one bond from either an $\alpha$ or $\gamma$ position is bonded to the —N—, —NH— or =N— group in the above cyclized structures I–IV; and

wherein each $R_6$ represents a monovalent member selected from the group consisting of hydrogen, methyl, ethyl, propyl, butyl and pentyl, and both $R_6$ members are not required to be the same; and

$R_2$ is a monovalent member selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, arylalkyl, substituted arylalkyl, aryl, substituted aryl, heterocyclic, substituted heterocyclic; said substituents being selected from the group consisting of methyl, phenyl, pyridyl, F(aromatic), Cl(aromatic), —CN, —COOH and its salts, $-COOC_6H_5$, $-SO_3H$ and its salts, —SH, thioaryl, thioalkyl, $-CH{=}CHC_6H_5$, and N,N-(dialkylamino), with the proviso that each of the several $R_1$'s, $R_2$'s, $R_3$'s, $R_4$'s and $R_5$'s in any recurring unit is not required to be the same as the R's in any other recurring unit, and the symbol ⟶ represents possible isomerism.

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**3,896,084**

## COPOLYMERS OF ACETONE WITH UNSATURATED COMPOUNDS OF ALIPHATIC SERIES AND A METHOD FOR PREPARING SAME

**Alexandr Ivanovich Bolshakov, Obschezhitie NNTS, kv. 309; Alfa Ivanovich Mikhailov, ulitsa Pervaya, 16, kv. 11; Igor Mstislavovich Barkalov, ulitsa Galushkina, 17, kv. 92, and Vitaly Iosifovich Goldansky, Vorobievskoe shosse, 2b, kv. 45, all of Moscow, U.S.S.R.**

**Filed May 30, 1973, Ser. No. 365,174**

**Claims priority, application U.S.S.R., July 21, 1972, 1813887**

**Int. Cl. C08g** *15/00*

**U.S. Cl. 260—63 R** **7 Claims**

1. Copolymers of acetone with a compound selected from the group consisting of acrylic acid and its esters, anhydrides, and imides.

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**3,896,085**

## EMULSION COPOLYMERS OF ACROLEIN AND THEIR USE IN TREATING LEATHER

**Bjorn E. Larsson, Rushland, and Stanley Le Sota, Horsham, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 160,178, July 6, 1971, abandoned. This application Apr. 12, 1973, Ser. No. 350,573**

**Int. Cl. C08f** *15/12*

**U.S. Cl. 260—67 UA** **7 Claims**

1. An emulsion copolymer of

a. from about 0.25 to 4% by weight of acrolein;

b. from about 0.5 to about 10% by weight of an $\alpha,\beta$-ethylenically unsaturated carboxylic acid or a mixture of $\alpha,\beta$ethylenically unsaturated carboxylic acids;

c. from 0 to about 99.25% by weight of a alkyl ($C_1$–$C_{24}$) ester of methacrylic acid or a mixture of alkyl ($C_1$–$C_{24}$) esters of methacrylic acid; and

d. up to about 99.25% by weight of a alkyl ($C_1$–$C_8$) ester of acrylic acid or of a mixture of alkyl ($C_1$–$C_8$) esters of acrylic acid, the sum of ($a$+$b$+$c$+$d$) always being 100 parts by weight.

**3,896,086**

## PROCESS FOR THE PREPARATION OF BIODEGRADABLE POLYCARBOXYLATES

**Heinz Haschke; Gerhard Morlock, both of Grossauheim, and Wilfried Felber, Grosswelzheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany**

**Filed June 5, 1974, Ser. No. 476,633**

**Claims priority, application Germany, June 14, 1973, 2330260**

**Int. Cl.² C08F** *16/34*

**U.S. Cl. 260—67 UA** **37 Claims**

1. In a process for the preparation of an improved biological degradable polycarboxylate by the oxidative polymerization of acrolein alone or with acrylic acid, said process comprising slowly adding acrolein monomer or acrolein-acrylic acid monomer mixture to a heated, moving aqueous hydrogen peroxide solution, the improvement comprising slowly adding to said peroxide solution about 0.1 to about 10% by weight of n-dodecyl mercaptan, related to the weight of monomer or monomer mixture, during polymerization.

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**3,896,087**

## MANUFACTURE OF STABLE UREA/FORMALDEHYDE RESINS IN A THREE STAGE REACTION

**Friedrich Brunnmueller; Helmut Henkel, and Johann Lenz, all of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany**

**Filed July 12, 1972, Ser. No. 271,054**

**Claims priority, application Germany, July 16, 1971, 2135738**

**Int. Cl. C08g** *9/10*

**U.S. Cl. 260—69 R** **2 Claims**

1. A process for the manufacture of impregnating urea/formaldehyde resins, particularly for use in the surface-treatment of wood materials, which comprises:

a. reacting urea and formaldehyde in aqueous acid solution in a molar ratio of from 1:1.5 to 1:2.5 and at a concentration to give a 40 to 70% solids content resin solution, the pH being from 4.5 to 6.5, the reaction being conducted to at least such an extent that a sample of the solution causes turbidity when added dropwise to cold 50% magnesium sulfate solution, but not to an extent exceeding the point at which the resin still remains soluble in the solution at temperatures above 60°C;

b. adding at least 0.2 moles of formaldehyde per mole of urea to obtain a molar ratio of urea to formaldehyde of from 1:2.5 to 1:4 followed by condensing at a temperature of between 40°C and the boiling point of the solution and at a pH of between 3.5 and 9 until the resin solution is capable of being diluted with at least 20 volumes of water at room temperature to form a clear solution; and

c. adding urea to give a final molar ratio of urea to formaldehyde of from 1:1.5 to 1:2.5 effecting post-condensation of the mixture of a pH of between 4.0 and 6.5 until all free urea has disappeared.

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**3,896,088**

## FLUORINATED OILY SOIL RELEASE AGENTS

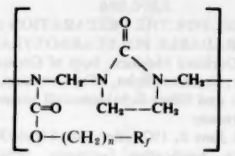
**Stuart Raynolds, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Nov. 24, 1972, Ser. No. 309,447**

**Int. Cl. C08g** *9/36*

**U.S. Cl. 260—70 R** **5 Claims**

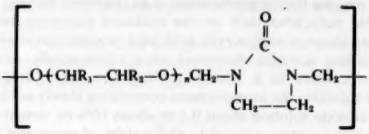
1. An adduct containing units



wherein

*n* is an integer of from 1 through 12 and

$R_f$ is perfluoroalkyl of from 4 through 16 carbon atoms; and



wherein

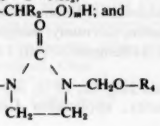
*m* is an integer of from 10 through 300,

$R_1$ is hydrogen or methyl and $R_2$ is hydrogen or methyl with the limitation that at least one of $R_1$ and $R_2$ is hydrogen; prepared by condensing in the presence of an acid catalyst

A) $R_f(CH_2)_n—O—\overset{O}{\overset{\|}{C}}—NH_2$;

B) $HO(CHR_1—CHR_2—O)_mH$; and

C)



wherein

*m*, *n*, $R_f$, $R_1$ and $R_2$ are as defined above,

$R_3$ is alkyl of from 1 through 4 carbon atoms

and $R_4$ is alkyl of from 1 through 4 carbon atoms;

wherein the molar ratio of A to B is from about 0.25:1 to 9:1, and the molar ratio of A + B to C is from about 0.6:1 to 1.5:1, the condensation being carried out at a temperature of about from 50° to 150°C. to distill from the system alcohol formed by the condensation.

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**3,896,089**

## SOLUTION FOR FORMING THERMAL RESISTING POLYMERS

**Yuzuru Noda; Makoto Kojima; Shiro Mazaki, and Yasutada Katashiba, all of Ibaragi, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaragi, Japan**

**Filed Apr. 4, 1973, Ser. No. 347,761**

**Claims priority, application Japan, Apr. 4, 1972, 47-34046**

**Int. Cl. C08g** *22/32, 20/32*

**U.S. Cl. 260—77.5 TB** **2 Claims**

1. A solution for forming thermal resisting polymers comprising a mixture of a prepolymer solution and blocked polyisocyanate compound in an approximately stoichiometric equivalent amount to said prepolymer, said prepolymer having been prepared by reacting an organic diisocyanate or diamine and a molar excess of 1,2,3,4-butane-tetracarboxylic acid or an anhydride thereof and the prepolymer having an imide group in the main chain of the molecule and an acid group at the terminals of said molecule, wherein said blocked polyisocyanate is a blocked compound of a polyisocyanate having a hydantoin ring in the main chain of the molecule, and having isocyanate groups at both terminals of the molecule prepared by reacting the glycine derivatives represented by the general formula

$$[R_1OOC(R_2)_2CHN]_2R_3$$

wherein $R_1$ and $R_2$, which may be the same or different, each represent a hydrogen atom or a lower alkyl group, and $R_3$ represents a divalent organic group with a molar excess amount of an organic diisocyanate.

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**3,896,090**

## PROCESS FOR PREPARING POLYCARBONATES

**Michael J. Maximovich, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 215,410, Jan. 4, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 393,875**

**Int. Cl. C08g** *17/13, 17/007*

**U.S. Cl. 260—77.5 D** **11 Claims**

1. In the process for preparing polycarbonates by the polymerization of alkylene carbonate, or 1,2-epoxide and carbon dioxide, with from about 0.005 to about 0.2 mole of an organic compound having at least 2 active hydrogens per mole of epoxide or alkylene carbonate, the improvement which comprises conducting said polymerization in the presence of a catalytic amount of a catalyst selected from the group consisting of alkali metal, alkaline earth metal or ammonium hydrocarbyloxy titanate catalyst, and sodium, potassium, lithium and ammonium tetraborates and metaborates.

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**3,896,091**

## MODIFIED POLYVINYL CHLORIDE

**Hubert Jakob Fabris, Akron; Heinz Uelzmann, and Willem Johannes Van Essen, both of Tallmadge, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio**

**Filed Feb. 13, 1974, Ser. No. 442,259**

**Int. Cl.² C08G** *63/76;* **C08F** *114/06*

**U.S. Cl. 260—78.4 D** **7 Claims**

1. A process for preparing a modified polyvinyl chloride which comprises (1) reacting in a Diels-Alder reaction polyvinyl chloride and a dienophile in an amount of at least 70 parts by weight of dienophile per 100 parts by weight of non-modified polyvinyl chloride at ambient pressure and at a temperature in the range of from about 100°C. to 300°C. but not above the reflux temperature of the system for 1 to 60 hours under conditions under which said polyvinyl chloride dehydrochlorinates, said dienophile being a sufficinet solvent for said polyvinyl chloride at least to swell said polyvinyl chloride and being substantially unreactive with hydrogen chloride under said reaction conditions, and

(2) recovering the resulting modified polyvinyl chloride.

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**3,896,092**

## MATERIAL FOR GEL PERMEATION CHROMATOGRAPHY

**Roger Epton, 22 Winchester Rise, Dudley, Worcestershire; Christopher Holloway, 12 Leicester Close, Smethwick, Worley, Worcestershire, and John Vincent McLaren, 35 York Ave., Finchfield, Wolverhampton, Staffordshire, all of England**

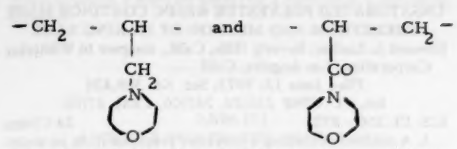
**Filed Sept. 15, 1972, Ser. No. 289,461**

**Claims priority, application United Kingdom, Sept. 15, 1971, 43093/71**

**Int. Cl. C08f** *19/00*

**U.S. Cl. 260—80.3 N** **5 Claims**

1. A cross-linked polymer having repeating units in the backbone chains, at least some of the repeating units of the backbone chains having morpholine groups covalently bonded through the nitrogen atom of the morpholine groups through divalent linking groups to the atoms constituting the backbone chains, said repeating morpholine units having morpholine groups selected from the group consisting of



said polymer further characterized in having cross-links between said backbone chains formed by copolymerized diethylenically unsaturated monomers, the molar ratio of said diethylenically unsaturated monomers to the other monomers in the polymer being from 1:150 to 1:1.5 so that sufficient cross-links exist between the backbone chains to make the polymer capable of forming a gel in water or chloroform.

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3,896,093

## PROCESS FOR THE PRODUCTION OF POLYMERS OF ACRYLONITRILE AND STYRENE AND OF ACRYLONITRILE, STYRENE, AND BUTADIENE

GianFranco Valoti, and Giancarlo Antonini, both of Milan, Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 26, 1973, Ser. No. 428,571
Claims priority, application Italy, Dec. 22, 1972, 33447/72
Int. Cl. C08d 7/6; C08c 1/4
U.S. Cl. 260—80.78 6 Claims

1. A process for the recovery of polymers of acrylonitrile and styrene optionally containing butadiene by coagulation of aqueous latices containing these polymers, which comprises maintaining said aqueous latices, in a first coagulation phase, in the presence of a coagulant selected from the group comprising hydrochloric acid, sulphuric acid, formic acid, oxalic acid, acetic acid, and a water soluble chloride, nitrate, sulphate, or acetate of sodium, potassium, calcium, magnesium, zinc or aluminum, at a temperature between equal to and up to about 15°C higher than the distortion temperature of the polymer for a time in the range of from about 10 to 100 minutes at atmospheric or greater pressure, and bringing the aqueous mixture obtained in this way into conditions of boiling or close to boiling in a second coagulation phase carried out in at least two stages, the product being maintained in such conditions for a time in the range of from about 10 to 100 minutes in each individual stage.

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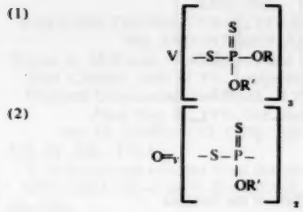
3,896,094

## PREPARATION OF ALPHA-OLEFIN COPOLYMERS WITH VANADIUM PHOSPHORODITHIOATE CATALYST

Harry D. Visser, Cheshire, and Walter Nudenberg, Newtown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,346
Int. Cl. C08f 15/40, 15/02, 1/42
U.S. Cl. 260—80.78 33 Claims

1. A method of copolymerizing ethylene and an alpha-olefin with or without a copolymerizable nonconjugated diene to form a copolymer of the said monomers comprising contacting the said monomers in an inert organic solvent with a catalyst which is a vanadium phosphorodithioate of one of the formulas (1) or (2)



where R and R′ are the same or different and are alkyl groups with 1 to 10 carbon atoms and a cocatalyst which is an alkyl aluminum halide.

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3,896,095

## HALOGENATION OF ETHYLENE TERPOLYMERS IN A WATER SLURRY

Richard T. Morrissey, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 12, 1973, Ser. No. 414,889
Int. Cl.² C08F 8/22
U.S. Cl. 260—80.78 4 Claims

1. The method of halogenating an ethylene-propylene-polyene terpolymer wherein said polyene is a polyunsaturated bridged-ring compound having at least one carbon-to-carbon double bond in a bridged ring and is a member of the group consisting of 5 -alkylidene-2-norbornenes wherein the alkylidene group contains 1–20 carbon atoms, the alkenyl-2-norbornenes wherein the alkenyl group contains 3 to 8 carbon atoms and the 5-alkadienyl-2-norbornenes wherein the alkadienyl group contains from 5 to 9 carbon atoms in a water system whereby the amount of halogen combined with 100 weight parts of said terpolymer is from 3.0 to 6.0 weight percent, comprising:

a. dispersing said terpolymer in crumb form in a water slurry wherein the weight percent of said crumb is in the range 12 to 25,
b. adding halogen in excess to said slurry with agitation,
c. Neutralizing said mixture with an alkaline medium,
d. Filtering, washing and drying said crumb.

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3,896,096

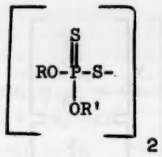
## MOLECULAR WEIGHT REGULATION OF ETHYLENE ALPHA-OLEFIN COPOLYMERS

Harry D. Visser, Cheshire, and Walter Nudenberg, Newton, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

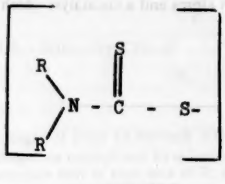
Filed Mar. 25, 1974, Ser. No. 454,993
Int. Cl. C08f 1/56, 1/80, 15/04, 15/40
U.S. Cl. 260—80.78 27 Claims

1. In a method of copolymerizing ethylene and an alpha-monoolefin, with or without a copolymerizable non-conjugated diene, in solution in an inert organic solvent in the presence of a vanadium salt-alkylaluminum halide anionic coordination polymerization catalyst which is soluble in said solvent, the improvement comprising carrying out the said polymerization in the presence of a regulator-activator selected from the group consisting of

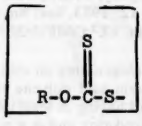
a. a bis(thionophosphonato) disulfide of the formula:



b. a thiuram disulfide of the formula



and c. a xanthogen disulfide of the formula:



where the R's are the same or different and are hydrocarbon groups containing 1 to 18 carbon atoms devoid of olefinic and acctylenic unsaturation selected from alkyl, cycloalkyl, aryl and aralkyl groups, whereby the molecular weight of the resulting copolymer is regulated and/or the catalyst is activated.

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**3,896,097**

**PROCEDURE FOR THE PRODUCTION OF POLYMERS AND COPOLYMERS OF ISOBUTYLENE**

**Aldo Priola; Sebastiano Cesca, and Giuseppe Ferraris, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy**

**Filed Apr. 17, 1973, Ser. No. 352,084**

**Claims priority, application Italy, Apr. 17, 1972, 23216/72**

**Int. Cl. C08d** *1/26, 3/04;* **C08f** *3/14*

**U.S. Cl. 260—85.3 R** **9 Claims**

1. Process for the production of polymers and copolymers of isobutylene, wherein the polymerization reaction is conducted in the presence of a catalytic system consisting essentially of:

a. a metalorganic compound of aluminum represented by the formula $AlR^1R^2X$ wherein X is a halogen atom; $R^1$ is ethyl; and $R^2$ is the same as $R^1$ or ethoxy,

and

b. $Cl_2O$ or, when (a) is AlEt.Oet.Cl, $SO_2$.

**3,896,098**

**UNSATURATED POLYESTER RESIN, COATINGS MADE THEREFROM AND METHOD OF MAKING SAME**

**Edward A. Lasher, Beverly Hills, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.**

**Filed June 13, 1973, Ser. No. 369,431**

**Int. Cl.² C08F** *236/20, 267/06;* **C08L** *67/06*

**U.S. Cl. 260—872** **24 Claims**

1. A method of making a polyester prepared from an unsaturated dicarboxylic acid component and a diol, said method comprising the steps of:

admixing about 3 moles of a diol with 2 moles of an unsaturated aliphatic dicarboxylic acid to provide a reaction mixture;

heating said reaction mixture to a temperature sufficient to esterify the reactants in said reaction mixture to produce a tetraester having end hydroxyl groups;

adding a monoester of an unsaturated monohydric alcohol and an unsaturated dicarboxylic acid to said tetraester in an amount to provide about 1.2 moles of said monoester per mole of said tetraester; and

heating the resulting mixture to esterify said tetraester and said monoester and continuing said heating until an acid number of less than about 28 is obtained on the solids in said mixture to produce said unsaturated polyester.

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**3,896,099**

**POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS WITH A 1,1,2,2-TETRACARBOALKOXY-DIARYL-ETHANE**

**Hendrik A. P. de Jongh, Oss, and Cornelis R. H. I. de Jonge, De Steeg, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands**

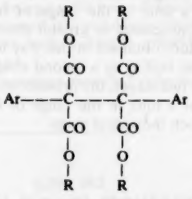
**Continuation-in-part of Ser. No. 159,949, July 2, 1971, abandoned. This application Sept. 28, 1973, Ser. No. 401,604**

**Claims priority, application Netherlands, July 3, 1970, 7009925**

**Int. Cl. C07c** *69/76;* **C08f** *7/04, 3/74*

**U.S. Cl. 260—93.5 R** **4 Claims**

1. In the process for the free radical-initiated polymerization of ethylenically unsaturated monomers, the improvement which comprises using as the free radical initiator a 1,1,2,2-tetracarboalkoxy-diaryl ethane of the formula



where Ar is a phenyl group substituted on the ortho-or ortho- and para-position by an alkyl group with 1 to 4 carbon atoms, a chlorine atom and/or a bromine atom, and R is a hydrocarbon containing 1 to 24 carbon atoms in an amount of from about 0.01 part to about 5 parts per 100 parts of reactants.

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**3,896,100**

**NUCLEATION OF ISOTACTIC POLYSTYRENE**

**Henry Nelson Beck, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 293,823, Oct. 2, 1972, Pat. No. 3,817,966. This application Mar. 21, 1974, Ser. No. 453,468**

**Int. Cl.² C08F** *7/04*

**U.S. Cl. 260—93.5 A** **1 Claim**

1. An isotactic polystyrene composition, the composition comprising in intimate admixture from about 99.995 to about 95 parts by weight of isotactic polystyrene and from about

0.005 to about 5 parts by weight of 4-hydroxy-6,7-dimethylpteridine.

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3,896,101

## ADDITIVE FOR PLASTIC MATERIALS

Robert H. McIntosh, and Ezekiel H. Hull, both of Greensboro, N.C., assignors to Anthony B. Askew, Atlanta, Ga.

Continuation-in-part of Ser. No. 139,265, April 30, 1971, Pat. No. 3,705,235. This application Nov. 16, 1971, Ser. No. 199,327

Int. Cl.[2] C08K *3/24, 5/17*

U.S. Cl. 260—93.7 7 Claims

1. Antistatic plastic material having incorporated therein an effective amount of an additive having a decomposition temperature above the molding temperature of the plastic material, said additive consisting essentially of a mixture of dimethyllaurylamine and barium acetate.

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3,896,102

## PREPARATION OF POLYBUTADIENE

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 25, 1974, Ser. No. 463,978

Int. Cl. C08d *1/14, 3/08*

U.S. Cl. 260—94.3 10 Claims

1. A method for polymerizing 1,3-butadiene comprising contacting 1,3-butadiene under polymerization conditions with a four-component catalyst comprising;

a. an organoaluminum hydride represented by the general formula $R_aAlH_b$ wherein R is alkyl, cycloalkyl or mixtures thereof containing from about 1 to 16 carbon atoms, *a* is an integer from 1 to 2, *b* is an integer from 1 to 2 such that the sum of *a* plus *b* equals 3;

b. an organolithium or organosodium compound represented by the general formula $R'M_x$ wherein *x* is an integer from 1 to 4, R' is a hydrocarbon radical selected from the group consisting of aliphatic and cycloaliphatic radicals containing from about 1 to 20 carbon atoms per radical and M is lithium or sodium;

c. a titanium halide component selected from the group consisting of titanium tetrachloride plus molecular iodine, titanium tetrabromide plus molecular iodine, and titanium tetraiodide; and

d. an ether represented by the general formula R''OR''' wherein R'' and R''' are alkyl or cycloalkyl groups containing from about 1 to 12 carbon atoms per R'' or R''' group and wherein the ether contains up to 20 carbon atoms per molecule.

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3,896,103

## ACYLATED DERIVATIVES OF TRP-MET-ASP-PHE-$NH_2$

Paul Martin Hardy, Exeter; George Wallace Kenner, Liverpool; Robert Charles Sheppard, Liverpool; John Selwyn Morley, Liverpool, and John Keith MacLeod, Liverpool, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 7, 1965, Ser. No. 462,107

Claims priority, application United Kingdom, June 25, 1964, 26355/64; Mar. 9, 1965, 9978/65

Int. Cl. C07c *103/52*; A61k *37/00*

U.S. Cl. 260—112.5 5 Claims

1. N-t-Butyloxycarbonyl-L-alanyl-L-phenylalanyl-L-isoleucylglycyl-L-tryptophanyl-L-methionyl-L-aspartyl-L-phenylalanine amide and the acid addition salts thereof.

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3,896,104

## P-GLU-HIS-TRP-SER-TYR-D-LYS-LEU-ARG-PRO-GLY-$NH_2$ AND INTERMEDIATES

Wayne A. McKinely, Wallingford, and Dimitrois Sarantakis, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,269

Int. Cl. C07c *103/52*; C07g *7/00*; A61k *37/00*

U.S. Cl. 260—112.5 5 Claims

1. A compound selected from the class consisting of L-p-Glu-L-His-L-Trp-L-Ser-L-Tyr-D-Lys-L-Leu-L-Arg-L-Pro-Gly-$NH_2$ (I)

and

R[5]-L-p-Glu-L-His($N^{im}$-R[6])-L-Trp-L-Ser($R^4$)-L-Tyr($R^3$)-D-Lys($R^2$)-L-Leu-L-Arg($N^G$-$R^1$)-L-Pro-Gly-X (II)

and its non-toxic salts; wherein

$R^1$ is a protecting group for the $N^\delta$, $N^\omega$ and $N^{\omega'}$ nitrogen atoms of arginine selected from the group consisting of nitro, tosyl, benzyloxycarbonyl, adamantyloxycarbonyl and tert-butyloxy-carbonyl or $R^1$ is hydrogen;

$R^2$ is selected from the group consisting of hydrogen and a protecting group for the side chain amino substituent;

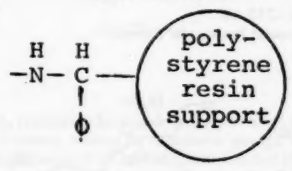
$R^3$ is a protecting group for the phenolic hydroxyl group of tyrosine selected from the group consisting of tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, p-bromobenzyloxycarbonyl and benzyloxycarbonyl or $R^3$ is hydrogen;

$R^4$ is a protecting group for the alcoholic hydroxyl group of serine and is selected from the group consisting of acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl and benzyl or $R^4$ is hydrogen;

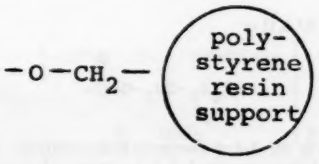
$R^5$ is selected from the group consisting of hydrogen or an $\alpha$-amino protecting group;

$R^6$ is a protecting group selected from the group consisting of tosyl, benzyl, trityl, 2,4-dinitrothiophenyl, 2,2,2-trifluoro-1-benzyloxycarbonylaminoethyl and 2,2,2-trifluoro-1-butyloxycarbonylaminoethyl; and

X is selected from the group consisting of $NH_2$, OH, O-(lower)alkyl, O-benzyl and an anchoring bond linked to a solid polystyrene resin represented by one of the formula




and




wherein said polystyrene resin is cross linked through the phenyl group on each second carbon atom of the alkyl chain of said polystyrene, with the proviso that at least one of $R^1$, $R^2$, $R^3$, $R^4$ and $R^6$ is other than hydrogen.

### 3,896,105
### (N-PROPIONYL) -GLY-CYS-LYS-ASN-PHE-PHE-TRP-LYS-THR-PHE-THR-ER-CYS-OH AND INTERMEDIATES

Sie-Yearl Chai, Royersford, and John P. Yardley, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,158
Int. Cl. C07c *103/52*; A61k *37/00*
U.S. Cl. 260—112.5 6 Claims

1. A tridecapeptide selected from those of the formula

(N-propionyl)-Gly-L-Cys-L-Lys-L-Asn-L-Phe-L-Phe-L-Trp-L-Lys-L-Thr-L-Phe-L-Thr-L-Ser-L-Cys-OH,

(N-propionyl)-Gly-L-Cys-L-Lys-L-Asn-L-Phe-L-Phe-L-Trp-L-Lys-L-Thr-L-Phe-L-Thr-L-Ser-L-Cys-OH

and the non-toxic acid addition salts therof.

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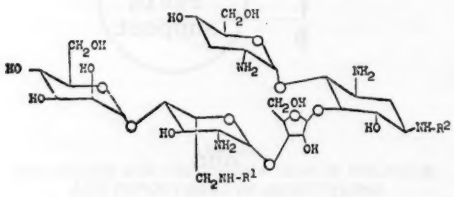
### 3,896,106
### ANTIBIOTIC DERIVATIVES

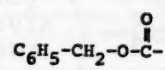
Takayuki Naito; Susumu Nakagawa, both of Tokyo, and Soichiro Toda, Koshigaya, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 266,164, June 26, 1972, abandoned. This application June 4, 1973, Ser. No. 366,925
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 AB 7 Claims

1. A compound having the formula



in which $R^1$ is H or



and $R^2$ is H, L-(−)-γ-amino-α-hydroxybutyryl, L-(−)-β-amino-α-hydroxypropionyl, L-(−)-γ-amino-α-hydroxyvaleryl, L-(−)-γ-benzyloxycarbonylamino-α-hydroxybutyryl, L-(−)-β-benzyloxycarbonylamino-α-hydroxypropionyl, or L-(−)-δ-benzyloxycarbonylamino-α-hydroxyvaleryl, wherein $R^1$ or $R^2$ must be other than H; or a nontoxic pharmaceutically acceptable acid addition salt thereof.

### 3,896,107
### DERIVATIZED ETHYL CELLULOSE

Eugene D. Klug, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 8, 1974, Ser. No. 449,568
Int. Cl. C07c *97/00*
U.S. Cl. 260—211 R 5 Claims

1. Ethyl cellulose substituted with tertiary lower alkyl amine group-containing substituents and having an ethoxyl D.S. of about 1.8 to 2.8 and a tertiary amine group substituent D.S. of about 0.05 to 0.4, said ethyl cellulose being soluble in dilute aqueous acid media and insoluble in neutral and alkaline aqueous media.

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### 3,896,108
### CARBOXYALKYL MODIFIED ETHYL CELLULOSE

Eugene D. Klug, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 10, 1974, Ser. No. 468,957
Int. Cl. C08b *11/00*
U.S. Cl. 260—231 A 4 Claims

1. A carboxyalkyl ethyl cellulose having an ethoxyl D.S. of about 2.0 to 2.8 and a carboxyalkyl D.S. of about 0.05 to 0.5 and selected from the class consisting of carboxymethyl and carboxyethyl, said modified ethyl cellulose being soluble in dilute aqueous bases and insoluble in neutral or acid aqueous medium.

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### 3,896,109
### 2,3-DEHYDRO-1H-1,4-BENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 185,381, Sept. 30, 1971, abandoned. This application Jan. 7, 1974, Ser. No. 431,111
Int. Cl.[2] C07D *243/14*, *295/12*
U.S. Cl. 260—239 BD 3 Claims

1. 7-Chloro-2,3-dihydro-5-(hydroxyamino)-1-methyl-1H-1,4-benzodiazepine.
2. N-(7-Chloro-2,3-dihydro-1-methyl-1H-1,4-benzodiazepine-5-yl)aminoxyacetic acid ethyl ester.
3. 7-Chloro-2,3-dihydro-1-methyl-5-(4-phenylpiperazino)-1H-1,4-benzodiazepine.

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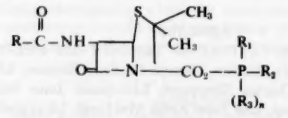
### 3,896,110
### PROCESS FOR PREPARATION OF 6-AMINOPENICILLANIC ACID

John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,397
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 8 Claims

1. A compound of the formula

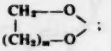


wherein:

R is selected from the class consisting of benzyl, phenoxymethyl, n-heptyl, n-amyl, 2-pentenyl, p-hydroxybenzyl and p-aminobenzyl;

$R_1$ or $R_2$ is a member selected from the class consisting of $C_1$ through $C_7$ alkoxy, phenoxy, naphthoxy, phenyl(lower)alkyloxy naphthyl(lower)alkyloxy and halogen;

$R_1$ and $R_2$ when joined together with the phosphorus atom form the ring



$R_3$ is =O (oxygen); *n* is a number which is 0 or 1; and *m* is a number from 0 to 6.

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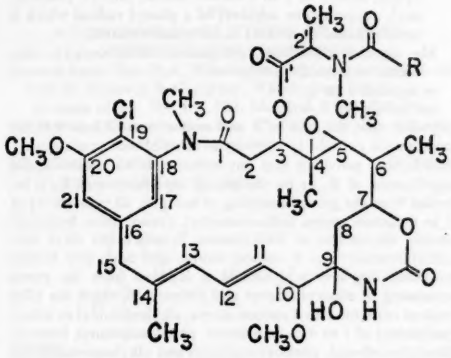
**3,896,111**

## ANSA MACROLIDES

**S. Morris Kupchan, Charlottesville, Va.; Yasuo Komoda, Chiba-shi, Japan; Gareth J. Thomas, Hitchin, England, and William A. Court, Delhi, Canada, assignors to Research Corporation, New York, N.Y.**

**Filed Feb. 20, 1973, Ser. No. 333,940**
**Int. Cl. C07d 99/02**
**U.S. Cl. 260—239.3 T** **4 Claims**

1. A compound selected from the group having the formula:



wherein R=$CH_3$, $CH_2CH_3$, or $CH(CH_3)_2$

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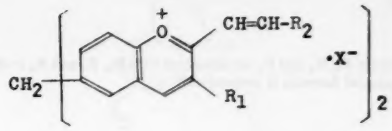
**3,896,112**

## BISBENZOPYRAN AND BISBENZOPYRYLIUM ADDUCTS

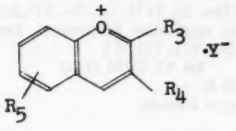
**Tomio Kubota; Katsue Kojima, and Masafumi Ohta, all of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Filed Oct. 20, 1972, Ser. No. 299,272**
**Claims priority, application Japan, Oct. 21, 1971, 46-83586**
**Int. Cl. C07d 7/32**
**U.S. Cl. 260—240 D** **6 Claims**

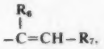
1. A compound which is a bisbenzopyran or bisbenzopyrylium adduct of a member selected from the group consisting of bisbenzopyrylium salts represented by the general formula I:



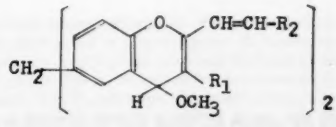
wherein $R_1$ represents hydrogen, iso- or normal-alkyl having 1 to 10 carbon atoms or phenyl; $R_2$ represents phenyl, naphthyl, styryl or any of these radicals having 1 to 3 substituents selected from methyl, alkoxy containing 1 to 4 carbon atoms; and X represents an anionic functional radical; and benzopyrylium salts represented by the general formula II:



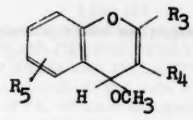
wherein $R_3$ represents methyl, phenyl or



wherein $R_6$ represents hydrogen or a lower alkyl radical having 1 to 3 carbon atoms; $R_7$ represents phenyl, naphthyl or these radicals having 1 to 3 substituents selected from methyl, methoxy, nitro, nitrile, halogen, carboxyl, amino and hydroxy; $R_4$ represents hydrogen, methyl or phenyl; $R_5$ represents hydrogen, lower alkyl containing 1 to 2 carbon atoms, alkoxy containing 1 to 2 carbon atoms, halogen, nitro or nitrile; and Y represents an anionic functional radical; and a member selected from the group consisting of bisbenzopyran derivatives having the following general formula I':



wherein $R_1$and $R_2$ are identical with $R_1$ and $R_2$ in the general formula I respectively;
and benzopyran derivatives having the following general formula II':



wherein $R_3$, $R_4$ and $R_5$ are identical with $R_3$, $R_4$ and $R_5$ in the general formula II respectively.

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3,896,113

## NOVEL METALLIZED HETEROCYCLIC DERIVATIVES

Bansi Lal Kaul, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

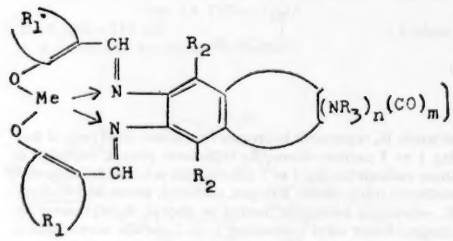
Filed Dec. 22, 1972, Ser. No. 317,518

Claims priority, application Switzerland, Dec. 31, 1971, 19258/71; Jan. 28, 1972, 1317/72

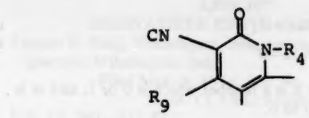
Int. Cl. C07d *51/02*

U.S. Cl. 260—240 G 18 Claims

1. A compound of formula



in which the radicals $R_1$, which may be the same or different, together with the carbon atoms to which they are attached, each signifies an unsubstituted or mono-, di-, tri- or tetra-substituted carbocyclic radical selected from the group consisting of 1,2-phenylene, 1,2-naphthalene and 2,3-napthalene, or a heterocyclic radical of the formula

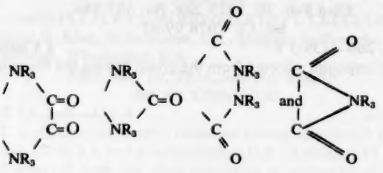


in which $R_4$ signifies hydrogen or an alkyl radical of 1 to 8 carbon atoms or a phenyl radical

and $R_9$ signifies an alkyl radical of 1 to 8 carbon atoms,

each $R_3$ is hydrogen, halogen or alkyl or alkoxy of 1 to 4 carbon atoms,

$>[(NR_3)_n(CO)_m]$ signifies a radical selected from



$R_3$ signifies hydrogen, an alkyl radical of 1 to 8 carbon atoms, which is unsubstituted or substituted by halogen, cyano, alkoxy of 1 to 8 carbon atoms, phenyl, phenoxy, acyl, acylamino or acyloxy, or a phenyl radical which is unsubstituted or mono-, di- or tri-substituted,

Me signifies chromium, manganese, iron, copper, zinc, nickel or cobalt,

*m* signifies 1 or 2,

and *n* signifies 1 or 2,

provided that the sum of *n* and *m* is at least 3 and that the compounds contain no carboxylic or sulphonic acid groups, and further provided that any substituent on a carbocyclic significance of $R_1$ or on the phenyl significance of $R_2$ is selected from the group consisting of halogen, alkyl or alkoxy of 1 to 8 carbon atoms, trifluoromethyl, cyano, nitro, hydroxylamine, alkylamino or dialkylamino in which the alkyl radical(s) contain 1 to 8 carbon atoms, and acyl, and further provided that any acyl radical is selected from the group consisting of alkoxycarbonyl and alkanoyl in which the alkyl radical contains 1 to 4 carbon atoms, alkylsulphonyl or alkoxysulphonyl of 1 to 4 carbon atoms, phenylsulphonyl, benzoyl, phenoxycarbonyl, phenoxysulphonyl and alkylaminocarbonyl and dialkylaminocarbonyl in which the alkyl radical(s) contain 1 to 4 carbon atoms.

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3,896,114

## CHROMONE DERIVATIVES

Akira Nohara, 15-12, Kamizato-torimi-cho, Kyoto; Tomonobu Umetani, 34, Deguchi-cho, and Yasushi Sanno, 3-18, 4-chome, both of Osaka, all of Japan

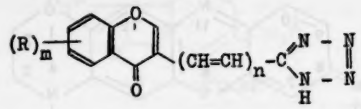
Filed Apr. 10, 1973, Ser. No. 349,848

Claims priority, application Japan, Apr. 12, 1972, 47-37235

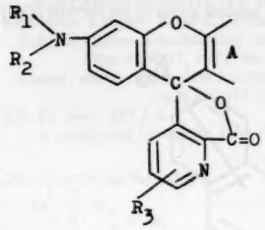
Int. Cl. C07d *55/00*

U.S. Cl. 260—240 E 45 Claims

1. A compound of the general formula

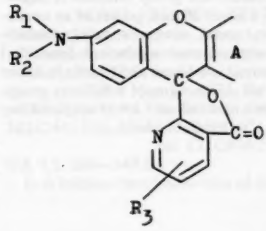


wherein *m* is 0, 1 or 2, *n* is 0 or 1, and each of R's represents halogen atom, nitro, hydroxy, straight or branched alkyl having 1 to 6 carbon atoms, cyclopentyl, cyclohexyl or butadienylene (—CH=CH—CH=CH—) which forms a benzene ring with any two adjacent carbon atoms at positions 5, 6, 7 and 8, lower alkoxy, RCOO—, wherein R is a straight or branched chain alkyl having 1 to 3 carbon atoms or phenyl, —COOR, wherein R is hydrogen alkyl having 1 to 3 carbon atoms, benzyl or phenethyl, carboxamide which may be unsubstituted or substituted by at least one alkyl having 1 to 3 carbon atoms or benzyl, or amino group which may be unsubstituted or substituted by RCO—, wherein R is a straight or branched chain alkyl having 1 to 3 carbon atoms or phenyl, or alkyl having up to 3 carbon atoms, benzyl, phenethyl, phenyl or naphthyl, or their pharmaceutically acceptable salts.



(Ia)

or



(Ib)

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**3,896,115**

## 6,7-EPOXYGERANYL ETHERS OF OXYGEN HETEROCYCLIC COMPOUNDS

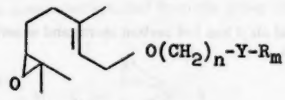
**Edward Koon Wah Wat, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.**

**Division of Ser. No. 231,394, March 2, 1972, Pat. No. 3,823,162. This application Dec. 27, 1973, Ser. No. 428,719**

**Int. Cl. C07d** *327/04, 327/06*

**U.S. Cl. 260—240 R** **2 Claims**

1. A compound of the formula



wherein

*n* is 0 to 3;

Y is a 5- or 6-membered divalent ring having 1 atom of oxygen and 1 atom of sulfur in non-adjacent relationship and 3 or 4 carbon atoms;

R is hydrogen, alkyl, perchloroalkyl or alkoxy each having up to 4 carbon atoms; and

*m* is 1.

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**3,896,116**

## LACTONE COMPOUNDS DERIVED FROM PYRIDINE-CARBOXYLIC ACIDS AND PROCESS FOR PREPARING THE SAME

**Minoru Ozutsumi; Yoshihide Miyazawa, and Susumu Suzuka, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan**

**Filed Mar. 25, 1974, Ser. No. 454,526**

**Claims priority, application Japan, Mar. 23, 1973, 48-32746**

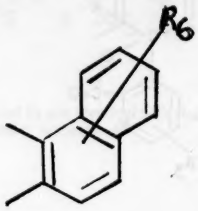
**Int. Cl. C07d** *7/42, 5/14*

**U.S. Cl. 260—240 D** **9 Claims**

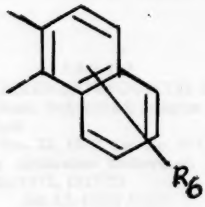
1. A lactone compound represented by the following formula

or a mixture thereof, wherein $R_1$ represents a hydrogen atom, a lower alkyl group or a benzyl group, $R_2$ represents a lower alkyl group, a benzyl group or an unsubstituted or substituted phenyl group wherein the substituent is a lower alkyl group or a halogen atom, $R_3$ represents a hydrogen atoms, a lower alkyl group, a halogen atom or a phenyl group, and the partial structure

represents a naphthalene residual group of the formula (IV*a*) or (IV*b*)



(IVa)



(IVb)

wherein $R_6$ represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen atom, an amino group, a mono-lower alkylamino group, di-lower alkylamino group, a monobenzylamino group, a dibenzylamino group, an N-lower alkyl-N-benzylamino group, an anilino group, an N-lower alkylanilino group, a —NHCO—X group wherein X represents a lower alkyl group, a lower alkenyl group, or an unsubstituted or substituted styryl group, an unsubstituted or substituted phenyl group or an unsubstituted or substituted naphthyl group wherein the substituent is a lower alkyl group, a lower alkoxy group, a di-lower alkylamino group, a hydroxy group, a nitro group or a halogen atom and said lower alkyl, alkoxy and alkenyl groups have 1 to 5 carbon atoms.

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**3,896,117**

**SALTS OF MORPHOLINO-(2,3-b) PHENOX AZONIUM AND HAIR DYE AND HAIR SETTING LOTION COMPOSITIONS CONTAINING THE SAME**

**Andrée Bugaut, Boulogne-sur-Seine, and Monique Laudon, Gagny, both of France, assignors to L'Oreal, Paris, France**

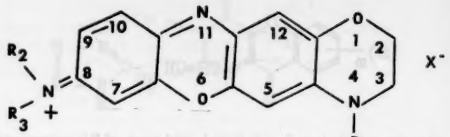
**Division of Ser. No. 165,740, July 23, 1971, Pat. No. 3,824,074. This application Jan. 30, 1973, Ser. No. 328,091**

**Claims priority, application Luxembourg, July 31, 1970, 61452**

**Int. Cl. C09b *19/00***

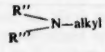
**U.S. Cl. 260—242** **2 Claims**

**1. A phenoxazonium salt having the formula**

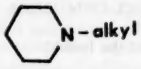


wherein $R_1$ is selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms.

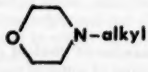
$R_2$ and $R_3$ each independently are selected from the group consisting of alkyl having 1–4 carbon atoms, hydroxyalkyl having 1–4 carbon atoms, carbamylalkyl having 1–4 carbon atoms, ω-aminoalkyl having 1–4 carbon atoms, ω-aminoalkyl of the formula R′-CONH-alkyl wherein R′ is selected from the group consisting of alkyl having 1–4 carbon atoms and phenyl and -alkyl has 1–4 carbon atoms, ω-aminoalkyl of the formula



wherein R″ and R‴ are selected from the group consisting of hydrogen and alkyl having 1–4 carbon atoms with at least one of R″ and R‴ being said alkyl and -alkyl has 1–4 carbon atoms, ω-aminoalkyl of the formual



wherein said alkyl has 1–4 carbon atoms and ω-amino alkyl of the formula



wherein said alkyl has 1–4 carbon atoms, and X is selected from the group consisting of Cl, Br, $ClO_4$ and $Cl_3Zn$ and the tautomeric forms thereof.

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**3,896,118**

**PROCESS FOR PRODUCING 7-AMINOCEPHALOSPORANIC ACIDS**

**Toshiyasu Ishimaru, Osaka, and Yutaka Kodama, Toyama, both of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan**

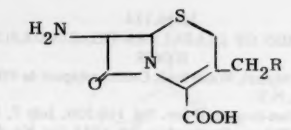
**Filed Oct. 8, 1971, Ser. No. 187,910**

**Claims priority, application Japan, Nov. 17, 1970, 45-90973**

**Int. Cl. C07d *99/24***

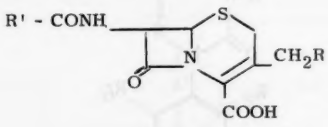
**U.S. Cl. 260—243 C** **13 Claims**

**1. A process for producing 7-aminocephalosporanic acids of the formula:**

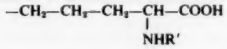


wherein R signifies a hydrogen atom, acetoxy, lower alkoxy or lower alkythio, which comprises:

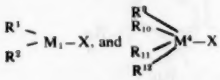
A. reacting a 7-acylamidocephalosporanic acid of the formula:



wherein R′ signifies phenyl lower alkyl, phenoxy lower alkyl, thienyl lower alkyl or



wherein R″ signifies phenyl lower alkyl carbonyl and R is the same as defined above, in the presence of an acid-binding agent selected from the group consisting of triethylamine, N-loweralkylmorpholine, N-loweralkylpiperidine, quinoline, N,N-lowerdialkylaniline pyridine, picoline and lutidine, with a phosphorus compound selected from the group consisting of:



wherein each of $R^1$ and $R^2$ which may be the same or different, and signifies halogen, lower alkyl, phenyl, lower alkoxy, or lower alkoxy which is substituted by lower alkoxy, halogen, phenoxy, phenyl, cyclohexyloxy or $R^1$ and $R^2$ jointly form 1, 3, 2-dioxaphospholane; each $R^9$ to $R^{12}$ signifies halogen, lower alkoxy, lower alkoxy substituted by a lower alkoxy or halogen, phenoxy, phenyl lower alkoxy or phenyl, or $R^{11}$ and $R^{12}$ jointly signify O; $M^3$ and $M^4$ signify phosphorous; and X signifies a halogen.

B. reacting the resulting product with an imido halide-forming reagent selected from the group consisting of phosphorous oxychloride, phosphorous pentachloride, phosphorous tribromide, phosphorous pentabromide, phosgene, thionyl chloride, oxalyl chloride, protocatechinylphosphorous trichloride and toluenesulfonylchloride, to obtain the corresponding imido halide,

C. reacting the resulting imido halide with a hydroxyl compound selected from the group consisting of lower alkanol, lower alkyl substituted lower alkanol, benzyl alcohol, cyclohexanol, ethyleneglygol monolower-alkyl ether, ethylene chlorohydrin, and β-cyanoethanol to obtain the corresponding imino ether, and

D. hydrolyzing the imino ether to obtain 7-aminocephalosporanic acid.

**3,896,119**

## XANTHINES SUBSTITUTED IN THE 8-POSITION

**Karl-Heinz Klingler, Langen, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany**

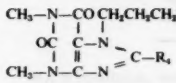
**Filed Sept. 27, 1972, Ser. No. 292,798**

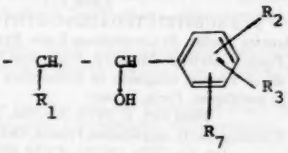
**Claims priority, application Austria, Oct. 28, 1971, 9312/71**

**Int. Cl. C07d** *87/34*

**U.S. Cl. 260—247.2 A** **23 Claims**

1. A compound having the formula:





wherein $R_1$ is hydrogen or methyl, $R_2$ and $R_3$ are hydrogen, methyl, hydroxy or hydroxymethyl, $R_7$ is hydrogen or methyl and $R_4$ is

where $R_5$ and $R_6$ individually are hydrogen or alkyl of 1 to 6 carbon atoms or $R_5$ and $R_6$ collectively together with the nitrogen atom form a 5 to 7 membered heterocyclic ring with 0 to 1 additional hetero atom and 0 to 2 alkyl substituents, said additional hetero atom being nitrogen, sulfur or oxygen, or a pharmacologically acceptable salt thereof.

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**3,896,120**

## NOVEL TRIAZINO-BENZIMIDAZOLES

**Hans Rochling, Altenhain, Taunus, and Kurt Hartel, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany**

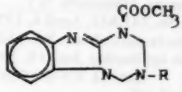
**Filed May 14, 1973, Ser. No. 361,073**

**Claims priority, application Germany, May 18, 1972, 2224244; Feb. 13, 1973, 2308067**

**Int. Cl. C07d** *55/12*

**U.S. Cl. 260—249.5** **18 Claims**

1. A triazino-benzimidazoles of the formula



where

R is alkyl having from 1 to 18 carbon atoms; alkenyl having from 3 to 18 carbon atoms, alkinyl having from 2 to 8 carbon atoms, cycloalkyl having from 3 to 12 carbon atoms, optionally substituted by one or more alkyl groups having from 1 to 4 carbon atoms or by hydroxy;

cyclohexylalkyl, cyclohexylalkenyl, or cyclohexylalkinyl each having from 1 to 3 carbon atoms in the chain, endomethylene-cyclohexylmethyl, endomethylenecyclohexenylmethyl, tricyclodecyl, or tricyclodecenyl; phenalkyl, diphenylalkyl or triphenylalkyl each having from 1 to 6 carbon atoms in the alkylene radical, the phenyl nuclei of which being optionally substituted by halogen, alkyl, alkoxy or alkylthio each having from 1 to 4 carbon atoms or by di-($C_1$–$C_4$)amino;

phenyl or naphthyl, optionally being substituted by alkyl having from 1 to 4 carbon atoms, halogen, halogeno-alkyl having from 1 to 4 carbon atoms, trifluoromethyl, hydroxy, alkoxy having from 1 to 4 carbon atoms phenoxy or $(C_1–C_4)$-alkylthio; di-$(C_1–C_4)$-alkyl-amino-$(C_2–C_6)$-alkyl; hydroxy$(C_2–C_{12})$-alkyl, $(C_2–C_{18})$-alkoxyalkyl or dialkoxyalkyl, $(C_2–C_{18})$-alkylmercaptoalkyl, $(C_3–C_9)$-dialkylphosphinylalkyl, furfuryl, morpholino-$(C_1–C_4)$-alkyl, pyrrolidino-$(C_1–C_4)$-alkyl, piperidino-$(C_1–C_4)$-alkyl or $(C_2–C_{12})$-carbalkoxylalkyl.

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## 3,896,121
## S-(β-SUBSTITUTEDAMINO-ETHYL)-CYSTEINE

**Maurice Joullie, St-Germain-en-Laye, France; Lucien Lakah, Paris; Gabriel F. Maillard, Paris, and Pierre Muller, Paris, all of France, assignors to Recherches Pharmaceutiques et Scientifiques, Paris, France**

**Filed Oct. 2, 1972, Ser. No. 294,105**
**Claims priority, application France, Oct. 4, 1971, 71.35680**
**Int. Cl. C07c** *149/24;* **C07d** *29/36, 87/46*
**U.S. Cl. 260—247.1 R** **2 Claims**

1. A cysteine derivative selected from the group consisting of S-(β-dimethylamino-ethyl)-cysteine, S-(β-diethylaminoethyl)-cysteine, S-(β-pyrrolidino-ethyl)-cysteine, S-(β-morpholinoethyl)-cysteine, S-(β-piperidino-ethyl)-cysteine and S-[β-(4-methylpiperazino)-ethyl]-cysteine or a monohydrochloride thereof.

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## 3,896,122
## MORPHOLINE DERIVATIVES OF 3,4,5-TRICHLORO-2,6-PYRIDINEDICARBONITRILE

**Christian T. Goralski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed July 2, 1973, Ser. No. 375,415**
**Int. Cl. C07d** *87/40*
**U.S. Cl. 260—247.5 G** **3 Claims**

1. A compound selected from the group consisting of 3,4-dichloro-5-(4-morpholinyl)-2,6-pyridinedicarbonitrile and 3,5-dichloro-4-(4-morpholinyl)-2,6-pyridinedicarbonitrile.

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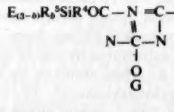
## 3,896,123
## SILYL CYANURATES

**George P. DeZuba, Mechanicville; Abe Berger, and Terry G. Selin, both of Schenectady, all of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Division of Ser. No. 241,831, April 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 132,552, April 8, 1971, abandoned. This application Jan. 18, 1973, Ser. No. 324,778**
**Int. Cl. C07d** *55/50*
**U.S. Cl. 260—248 CS** **3 Claims**

1. A silyl cyanurate of the formula,



where G is selected from R′ radicals, $E_{(3-b)}R_b^5SiR^4$— radicals and R radicals, E is selected from $R^6O$— and $R^6COO$— where R, $R^5$ and $R^6$ are selected from the class consisting of lower alkyl radicals and halo lower alkyl radicals, R′ is a lower alkenyl radical, $R^4$ is a lower alkylene radical, *b* is a whole number varying from 0 to 3, inclusive, and wherein the Si atom may be attached to either the alpha or beta carbon atom in the $R^4$ radical.

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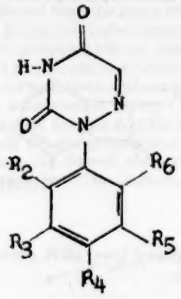
## 3,896,124
## PREPARATION OF 2 (ARYL)-AS-TRIAZINE-3,5(2H,4H)-IONES

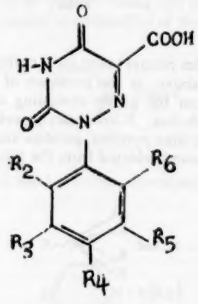
**Banavara L. Mylari, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 160,530, July 7, 1971, abandoned. This application Nov. 20, 1973, Ser. No. 417,675**
**Int. Cl. C07d** *55/10*
**U.S. Cl. 260—248 AS** **8 Claims**

1. A process for the preparation of a 2-(aryl)-as-triazine-3,5(2H,4H)dione of the formula



which comprises contacting compound A of the formula:

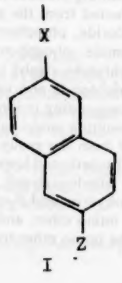


wherein

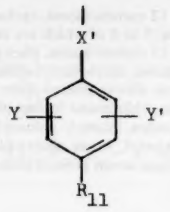
each of $R_2$ and $R_6$ is hydrogen, fluoro, chloro, cyano or methyl, with the proviso that at least one of $R_2$ and $R_6$ is hydrogen or fluoro;

each of $R_3$ and $R_5$ is selected from a first sub-group consisting of hydrogen, cyano, trifluoromethyl, halogen and lower alkyl; a second sub-group consisting of lower alkoxy and lower alkylthio; or a third sub-group consisting of nitro and thiocyanato;

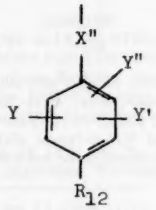
$R_4$ is $—NR_7R_8$, lower alkanoyl, lower alkyl sulfonyl, $SO_2NRR_1$;



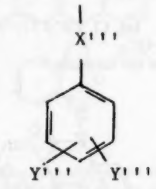
I



II



III



IV

or $-CH_2-NR_{13}R_{14}$;

with the proviso that when $R_4$ is $SO_2NRR_1$ or lower alkanoyl, at least one of $R_3$ and $R_5$ is other than hydrogen;

R is selected from the group consisting of methyl, ethyl, phenyl, benzyl, allyl, propargyl and p-chlorophenyl;

$R_1$ is selected from the group consisting of methyl, ethyl, allyl and propargyl;

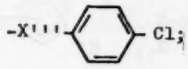
R and $R_1$ when taken together with the nitrogen to which they are attached are selected from the group consisting of pyrrolo, pyrrolino, pyrrolidino, piperidino, N-(lower alkyl)piperazino, hexamethyleneimino, 3,4-dichloropiperidino, thiazolidino, and $\Delta^3$-tetrahydropyridino and piperazino;

each of $R_7$ and $R_8$ is selected from the group consisting of lower alkyl of from 1 to 4 carbon atoms; $R_7$ and $R_8$ when taken together with the nitrogen atom to which they are attached are selected from the group consisting of pyrrolo, pyrrolino, pyrrolidino, piperidino, N-(lower alkyl)-piperazino, hexamethyleneimino, thiazolidino, $\Delta^3$-tetrahydropyridino and piperazino;

X''' is selected from the group consisting of oxygen, sulfur, >C = O, =NH, —S O, $-SO_2-$, and —CHOH—;

Y''' is hydrogen, nitro, cyano, halogen, lower alkyl, or lower alkoxy;

provided that where $R_3$ or $R_5$ is methyl or chloro and X''' is sulfur, $-SO_2-$, or >C = O, then $R_4$ is other than



$R_{11}$ is hydrogen, halogen, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, lower alkoxy, trifluoromethyl, or nitro;

$R_{12}$ is lower alkylthio, lower alkylsulfinyl, lower alkysulfonyl, trifluoromethyl, lower alkanoyl or $SO_2NR_{15}R_{16}$ wherein

$R_{13}$ and $R_{14}$ taken together with the nitrogen to which they are attached complete a morpholino, thiomorpholino, or thiazolidino ring;

$R_{15}$ is hydrogen, lower alkyl, propargyl, allyl, hydroxyethyl, acetoxyethyl, $\beta$-methylthioethyl, $\beta$-methoxyethyl, or 3-(2-methoxyethoxy)propyl;

$R_{16}$ is hydrogen, lower alkyl, propargyl, allyl, hydroxyethyl, or acetoxyethyl;

$R_{15}$ and $R_{16}$ when taken together with the nitrogen to which they are attached are pyrrolino, pyrrolidino, morpholino, thiomorpholino, N-(lower alkyl)piperazino, thiazolidino, $\Delta^3$-tetrahydropyridino or piperazino,

Z is hydrogen, lower alkylthio, or halogen;

Y, Y′ and Y″ are each hydrogen, halogen, lower alkyl, or trifluoromethyl;

X is oxygen, sulfur, or $-OCH_2-$;

X′ is $-OCH_2-$, $-SCH_2-$, $-SOCH_2-$, $-SO_2CH_2-$, or $-CH_2-$, $-OCH_2-CO-$,

X″ is oxygen, sulfur, SO, $SO_2$, >C=O, or —CHOH—;

with at least about 0.1 molar proportion of compound B which is mercapto-substituted-alkanoic acid of up to about eleven carbon atoms; thiosalicylic acid; or the lower alkyl esters thereof, until the reaction is substantially complete.

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**3,896,125**

## O-HYDROXYPHENYL-S-TRIAZINES

**Brunetti Helmo, Riehen; Peterli Hans Jakob, Fullinsdorf, Basel-Land, and Hansjorg Heller, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland**

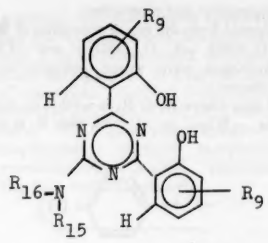
**Filed Jan. 21, 1964, Ser. No. 340,124**

**Claims priority, application Switzerland, Jan. 24, 1963, 847/63; Jan. 24, 1963, 843/63; Jan. 24, 1963, 844/63; Jan. 24, 1963, 845/63; Jan. 24, 1963, 846/63**

**Int. Cl. C07d** *55/18*

**U.S. Cl. 260—249.5** **4 Claims**

1. A substantially non-coloring light stabilizer for organic polymeric substrata which is sufficiently stable to heat up to at least 200°C to withstand incorporation at such temperature into said substrata, and which is of the formula



wherein $R_9$ is a member selected from the group consisting of hydrogen, chlorine, bromine, alkyl of from 1 to 18 carbon atoms, alkenyl of from 2 to 18 carbon atoms, cycloalkyl of from 5 to 8 carbon atoms, 5 to 6 of which are ring members, phenylalkyl of from 7 to 10 carbon atoms, alkylphenyl-alkyl of from 8 to 10 carbon atoms, chloro- and bromo-phenyl-alkyl of from 7 to 10 carbon atoms, phenyl, alkylphenyl of from 7 to 10 carbon atoms, chlorophenyl, bromophenyl, alkanoyloxy of from 1 to 18 carbon atoms, alkenoyloxy of from 3 to 18 carbon atoms and one double bond, carboxy-alkanoyloxy of from 4 to 12 carbon atoms, alkoxy-carbonyl-alkanoyloxy of from 3 to 13 carbon atoms, carboxy-alkenoyloxy of from 4 to 12 carbon atoms, alkoxy-carbonyl-alkenoyloxy of from 5 to 13 carbon atoms, benzoyloxy, alkylbenzoyloxy of from 7 to 10 carbon atoms, chloro-benzoyloxy, bromo-benzoyloxy, alkoxy-carbonyloxy of from 2 to 13 carbon atoms, cyclohexyloxycarbonyloxy, benzyloxycarbonyloxy and phenoxycarbonyloxy, and a radical of the formula —O—$R_5$ wherein

$R_5$ is a member selected from the group consisting of hydrogen, alkyl of from 1 to 12 carbon atoms, chloroalkyl, bromo-alkyl and hydroxyalkyl, each of from 2 to 12 carbon atoms, alkoxy-alkyl of from 1 to 8 carbon atoms in the alkoxy moiety and from 2 to 4 carbon atoms in the alkyl moiety, cyclohexyloxy-alkyl of from 2 to 4 carbon atoms in the alkyl moiety, the heteroatom of the substituent in alkyl in the five last-mentioned members being spaced by at least two carbon atoms from the -O-bridge in the above formula, cyano-alkyl of from 2 to 6 carbon atoms, carboxyalkyl of from 2 to 6 carbon atoms, alkoxycarbonyl-alkyl of from 1 to 8 carbon atoms in the alkoxy moiety, and from 1 to 5 carbon atoms in the alkyl moiety, N,N-di-(lower alkyl)-carbamyl-alkyl of from 1 to 5 carbon atoms in the last-mentioned alkyl moiety, alkenyl of from 3 to 8 carbon atoms, phenyl-alkyl of from 7 to 12 carbon atoms, and lower alkyl-phenyl-alkyl of from 1 to 5 carbon atoms in the last-mentioned alkyl moiety,

$R_{15}$ is a member selected from the group consisting of hydrogen and lower alkyl, and

$R_{16}$ is a member selected from the group consisting of alkyl of from 1 to 18 carbon atoms, amino-alkyl of 1 to 12 carbon atoms, hydroxy-alkyl of 1 to 12 carbon atoms, alkoxy-alkyl wherein the alkoxy moiety has from 1 to 8 carbon atoms and the alkyl moiety has from 1 to 12 carbon atoms, alkylthio-alkyl wherein the alkylthio moiety has from 1 to 8 carbon atoms and the alkyl moiety has from 1 to 12 carbon atoms, N-alkylamino-alkyl wherein the alkylamino moiety has from 1 to 8 carbon atoms and the alkyl moiety has from 1 to 12 carbon atoms, N,N-di-(alkyl)amino-alkyl wherein the N-alkyl groups have each from 1 to 8 carbon atoms, and the alkyl moiety bearing the amino group has from 1 to 12 carbon atoms, alkoxycarbonyl-alkyl wherein the alkoxy moiety has from 1 to 8, and the alkyl moiety from 1 to 12 carbon atoms, carboxy-alkyl with a total of from 2 to 13 carbon atoms, chloro-alkyl of from 1 to 12 carbon atoms, bromo-alkyl of from 1 to 12 carbon atoms, cycloalkyl of from 5 to 10 carbon atoms, 5 to 6 of which are ring members, alkenyl of from 3 to 17 carbon atoms, phenylalkenyl of from 9 to 12 carbon atoms, alkyl-phenyl-alkenyl of from 10 to 12 carbon atoms, alkoxy-phenyl-alkenyl of from 10 to 12 carbon atoms, chloro-and bromo-phenyl-alkenyl of 9 to 12 carbon atoms, phenyl, chlorophenyl, bromophenyl, lower alkyl-phenyl, lower alkoxy-phenyl, there being at least two carbon atoms present intermediate the nitrogen atom of

and the hetero atom in those of the aforesaid members of $R_{16}$ containing such hetero atom, and all of said members comprising alkenyl being bonded to the nitrogen atom of

via a saturated carbon atom of said alkenyl, benzyl, phenylethyl, chloro-, bromo-, lower alkyl- and lower alkoxy-substituted benzyl and phenyl-ethyl, cyano-alkyl of from 2 to 6 carbon atoms, and N,N-di-(lower alkyl)-carbamyl-alkyl of from 1 to 5 carbon atoms in the last-mentioned alkyl moiety.

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**3,896,126**

## 2-OXO-3 SPIROPYRAN QUINOXALINES

**Andreas Oberlinner, Mannheim; Hans Baumann, Ludwigshafen, and Klaus Grychtol, Bad Durkheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

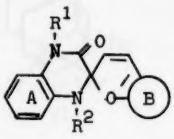
**Filed June 21, 1973, Ser. No. 372,298**

**Claims priority, application Germany, June 21, 1972, 2230225**

**Int. Cl. C07d** *51/78*

**U.S. Cl. 260—250 Q** **4 Claims**

1. Spiropyrans of the formula:



in which

$R^1$ is hydrogen, alkyl, cyanoalkyl, carboalkoxyalkyl or methoxyalkyl each of from 1 to 6 carbon atoms or phenyl,

$R^2$ is alkyl of from 1 to 4 carbon atoms,

A is a benzene nucleus optionally mono substituted by methyl, chlorine, bromine or alkoxy or from 1 to 4 carbon atoms, and

B is a benzene or naphthalene nucleus mono substituted by chlorine, bromine, nitro, alkyl, alkoxy or dialkylamino having from 1 to 5 carbon atoms in each alkyl group.

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**3,896,127**

## THEOPHYLLINE DERIVATIVES

**Hidehiko Takahashi, Tokyo; Yoshio Suzuki, Misato-Machi, and Tuyoshi Kinoshita, Koshigaya, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan**

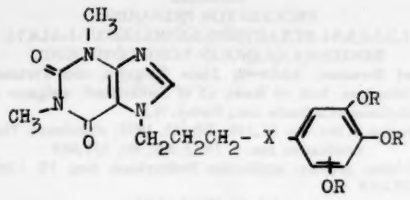
**Filed July 13, 1973, Ser. No. 378,806**

**Claims priority, application Japan, July 13, 1972, 47-70294**

**Int. Cl. C07d** *57/48*

**U.S. Cl. 260—256** **5 Claims**

1. A theophylline compound of the formula



wherein R is a lower alkyl having from 1 to 5 carbon atoms and X is oxycarbonyl, carboxyl or carbonyl.

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**3,896,128**

## LACTONES OF THE DIAZAXANTHENE SERIES AND DYE PRECURSORS FOR COPYING PROCESSES

**Hellmut Kast, Bobenheim-Roxheim, and Guenter Dünkelmann, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

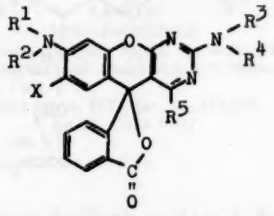
**Filed Aug. 29, 1973, Ser. No. 392,745**

**Claims priority, application Germany, Sept. 5, 1972, 2243483**

**Int. Cl. C07d** *51/42*

**U.S. Cl. 260—256.4 F** **5 Claims**

1. A diazaxanthene of the formula



wherein $R^1$ and $R^2$ denote hydrogen or alkyl of from 1 to 4 carbon atoms, $R^3$ and $R^4$ each denote alkyl having 1 to 4 carbon atoms or the group

denotes a five- or six-membered saturated heterocyclic ring which may contain a further N— as a member of the ring, and $R^5$ and X each denote hydrogen or methyl.

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**3,896,129**

## (2-PYRIMIDINYLTHIO) ALKANOIC ACIDS, ESTERS, AMIDES AND HYDRAZIDES

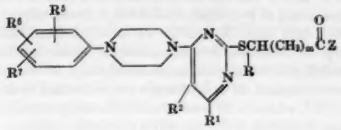
**Arthur A. Santilli, Havertown; Anthony C. Scotese, King of Prussia, and Rudolph M. Tomarelli, Phoenixville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.**

**Division of Ser. No. 240,266, March 31, 1972, Pat. No. 3,814,761. This application Oct. 24, 1973, Ser. No. 409,353**

**Int. Cl. C07d** *51/40*

**U.S. Cl. 260—256.5** **3 Claims**

1. A compound of the formula:



in which

R and $R^2$ are members independently selected from the group consisting of hydrogen and lower alkyl;

$R^1$ is a member selected from the group consisting of hydrogen, halo and lower alkoxy;

Z is a member selected from the group consisting of hydroxy, lower alkoxy, —OM and $-(NH)_pNH_2$, wherein *p* is 0 or 1 and M is an alkali metal cation, an alkaline earth metal cation or the ammonium ion;

$R^5$ is a member selected from the group consisting of lower alkyl, halo, aryl of 6 to 10 carbon atoms and haloaryl of 6 to 10 carbon atoms;

$R^6$ is a member selected from the group consisting of hydogen, lower alkyl, lower alkoxy and halo;

$R^7$ is a member selected from the group consisting of hydrogen and lower alkyl; and

*m* is one of the integers 0, 1 or 2.

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**3,896,130**

## OCTAHYDROBENZOCYCLOHEPTAPYRIDOISOQUINOLINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

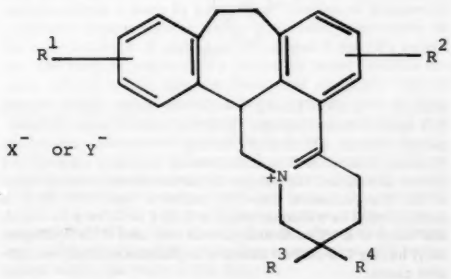
**Adolf H. Phillipp, Montreal; Leslie G. Humber, Dollard Des Ormeaux; Francois T. Bruderlein, Montreal, and Manfred K. Gotz, Hudson, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada**

**Filed Aug. 4, 1972, Ser. No. 278,167**

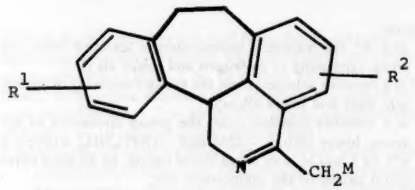
**Int. Cl. C07d** *33/32*

**U.S. Cl. 260—286 Q** **1 Claim**

1. A process for preparing a compound of the formula:



in which $R^1$ and $R^2$ are the same or different, selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, trifluoromethyl, and halo; X and Y are selected from the group consisting of chlorine, bromine, iodine, methylsulfonyloxy, phenylsulfonyloxy and p-toluenesulfonyloxy; $R^3$ is hydrogen or lower alkyl, and $R^4$ is hydrogen or protected hydroxyl of formula $OR^5$, wherein $R^5$ is selected from the group consisting of tetrahydropyran-2-yl, (α-ethoxy)ethoxy, t-butyl, trityl, acetyl, p-methoxybenzyl, propionyl, and benzyl, or $R^3$ and $R^4$ together represent an alkylenedioxy group having from two to four carbon atoms, comprising the step of reacting a compound of the formula



in which $R^1$ and $R^2$ are as defined herein and M is an alkali metal, selected from the group consisting of lithium, sodium or potassium, with a compound of formula $XCH_2CR^3R^4CH_2Y$, wherein X and Y are the same or different and selected from the group defined above; $R^3$ and $R^4$ as defined herein, and wherein the reaction is initiated at a temperature between −80°C and 20°C.

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**3,896,131**

**SUBSTITUTED BENZO(1J)QUINOLIZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF**

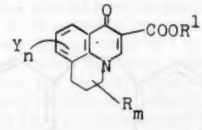
**John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.**

**Continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Nov. 2, 1972, Ser. No. 303,254**

**Int. Cl. C07d *33/48***

**U.S. Cl. 260—287 R** **25 Claims**

1. Carboxylic acids having the formula



wherein Y is alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, alkanamido having 1–4 carbon atoms, trifluoroacetamido or N,N-dialkylamino having a total of 2–4 carbon atoms, and the number of carbon atoms, when present in the Y-substituents, does not exceed a total of four, R is methyl, ethyl or trifluoromethyl, *n* is 0, 1 or 2, *m* is 0, 1 or 2, and when R is trifluoromethyl, *m* is one; and $R^1$ is hydrogen, alkyl having 1–4 carbon atoms or a pharmaceutically acceptable cation.

**3,896,132**

**PROCESS FOR PREPARING 1,2,3,8,9,9A-HEXAHYDRO-5,6-DIALKOXY-1-ALKYL-BENZO[D,E]QUINOLIN-7-ORE COMPOUNDS**

**Karl Bernauer, Allschwil; Janos Borgulya, and Fernand Schneider, both of Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

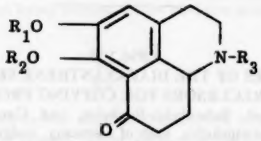
**Division of Ser. No. 57,348, July 22, 1970, abandoned. This application Jan. 4, 1973, Ser. No. 321,069**

**Claims priority, application Switzerland, Aug. 19, 1969, 12532/69**

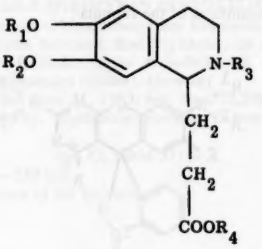
**Int. Cl. C07d *33/46***

**U.S. Cl. 260—289 R** **1 Claim**

1. A process for the preparation of a compound of the formula



wherein $R_1$, $R_2$ and $R_3$ are lower alkyl,
or acid addition salts thereof, comprising the step of cyclizing a compound of the formula



wherein $R_1$, $R_2$ and $R_3$ are as previously described and $R_4$ is hydrogen or lower alkyl,
or a salt thereof, by treatment with sulfuric acid containing free sulfur trioxide at a temperature in the range of about 65°C. to about 85°C.

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**3,896,133**

**SUBSTITUTED 10-HETEROCYCLICAMINOALKYL-9,10-IHYDROANTHRACENES**

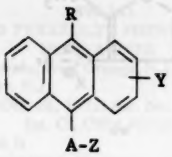
**Paul N. Craig, Ambler, and Charles L. Zirkle, Berwyn, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.**

**Division of Ser. No. 121,544, March 5, 1971, Pat. No. 3,766,183, which is a division of Ser. No. 742,171, July 3, 1968, Pat. No. 3,622,630, which is a continuation-in-part of Ser. No. 631,584, April 18, 1967, abandoned, which is a continuation-in-part of Ser. No. 526,975, Feb. 14, 1966, abandoned. This application June 28, 1973, Ser. No. 374,745**

**Int. Cl. C07d *29/36***

**U.S. Cl. 260—293.62** **4 Claims**

1. A chemical compound of the structural formula:



in which:
R is hydrogen, methyl, ethyl or phenyl;
Y is chlorine, methyl, trifluoromethyl, methylthio, methylsulfonyl or N,N-dimethylsulfamyl;
A is an alkylene chain of 2 to 4 carbon atoms; and
Z is N-pyrrolidinyl or N-piperidinyl.

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**3,896,134**
**3-PYRIDYLMETHYL CARBAMATE RODENTICIDES**
**Edward E. Kilbourn, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.**
**Division of Ser. No. 352,854, April 18, 1973, Pat. No. 3,835,147. This application Apr. 1, 1974, Ser. No. 456,933**
**Int. Cl.[2] C07D** *213/75*
**U.S. Cl. 260—295.5 C** **1 Claim**

1. The compound 3-pyridylmethyl N-(4-pyridyl)-carbamate.

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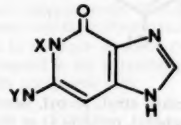
**3,896,135**
**3-DEAZAGUANINE**
**Robert J. Rousseau, Laguna Niguel, and Roland K. Robins, Santa Ana, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.**
**Filed July 6, 1973, Ser. No. 377,078**
**Int. Cl. C07d** *31/42*
**U.S. Cl. 260—296 H** **4 Claims**

1. A compound of the structure:



Where Y is $H_2$ and X is H or an (alkalai)alkali metal.

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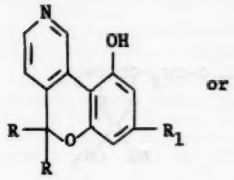
**3,896,136**
**METHOD FOR PROTECTING AQUEOUS COATING SYSTEMS FROM BACTERIAL ATTACK WITH BENZYL BROMO ACETATE**
**Seymour J. Lederer, Fair Lawn, N.J., assignor to Merck & Co., Inc., Rahway, N.J.**
**Continuation of Ser. No. 276,604, July 31, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,801**
**Int. Cl. C08f** *45/24*
**U.S. Cl. 260—29.6 R** **2 Claims**

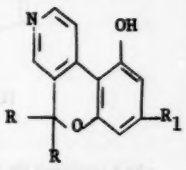
1. A method of preserving an aqueous paint and coating formulation susceptible to bacterial attack during storage prior to use against such bacterial attack comprising adding and mixing benzyl bromoacetate to such formulation in an amount such that the preserved formulation, including the benzyl bromoacetate, comprises from 0.025 to 1.00% by weight of benzyl bromoacetate.

**3,896,137**
**8-ALKYL AND ALKENYL-10-HYDROXY-5H[1]BENZOPYRANOPYRIDINE DERIVATIVES AND USES THEREOF**
**Clifton A. Baile, Glen Mills, Pa.; Paul E. Bender, Willingboro, N.J., and Bernard Loev, Broomall, Pa., assignors to Smith-Kline Corporation, Philadelphia, Pa.**
**Filed Mar. 11, 1974, Ser. No. 450,118**
**Int. Cl. C07d** *31/28*
**U.S. Cl. 260—297 T** **8 Claims**

1. A basic compound of the structure:



I



II

in which R is hydrogen, methyl or ethyl and $R_1$ is a straight or branched alkyl of from 1–20 carbon atoms; and its non-toxic pharmaceutically acceptable salts.

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**3,896,138**
**HIGH OPACITY RESIN COATINGS**
**Robert W. Kreider, St. Charles, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.**
**Continuation-in-part of Ser. No. 239,719, March 30, 1972, Pat. No. 3,819,542, and Ser. No. 245,266, April 18, 1972, and Ser. No. 277,918, Aug. 4, 1972, Pat. No. 3,817,880. This application Feb. 8, 1973, Ser. No. 330,672**
**Int. Cl. C09k** *1/02*
**U.S. Cl. 252—301.2 R** **12 Claims**

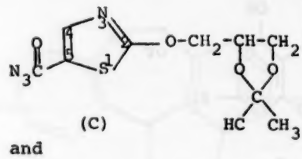
1. An aqueous latex coating composition adapted to deposit a film of low opacity resin which dries to produce a cellular film of high opacity and brightness, consisting essentially of an aqueous continuous phase having stably suspended therein polymer of emulsion polymerized unsaturated monomer in the form of particles of low opacity organic solvent-soluble resin, said polymer particles being swollen by having absorbed therein at least 5 parts by weight per 100 parts of polymer of a primary organic solvent which is essentially immiscible in the aqueous phase of said latex, and at least 5 parts by weight per 100 parts of polymer of a secondary water miscible organic solvent in said aqueous phase, said secondary organic solvent being a glycol having a lower evaporation rate than said primary solvent and a lesser capacity for solvating said polymer, said composition further including an organic solvent soluble optical brightener or fluorescent agent dissolved in said primary organic solvent and absorbed therewith in said polymer particles whereby, when said latex is deposited and dried, said solvents will evaporate to produce a film having a contrast ratio of at least about 0.7 in the absence of pigment and said optical brightener or fluorescent agent will be retained within the body of the film.

## 3,896,139
## PROCESS FOR PREPARING 3-(4-OR-5-AZIDOCARBONYLTHIAZOL-2-OXY)-PROPANEDIOL-1,2-ACETONIDES

Belig M. Berkoz; John A. Edwards, both of Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

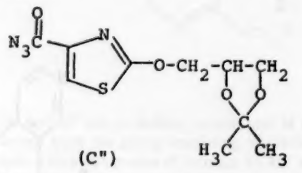
Filed Mar. 14, 1974, Ser. No. 451,194
Int. Cl. C07d 91/32
U.S. Cl. 260—302 R 9 Claims

1. A process for preparing a compound selected from the group having the formulas:



(C)

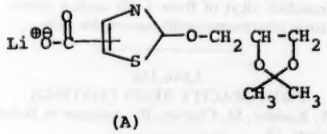
and



(C")

which comprises the steps of:

a. reacting the corresponding 4'- or 5'-substituted thiazole salt compound having the formula:



(A)

with a lower alkyl chloroformate in an inert organic solvent at temperatures in the range of about from −78° to 20°C., thereby affording the corresponding 4- or 5-lower alkoxycarbonyloxycarbonylthiazole derivative; and

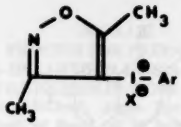
b. treating the product reaction mixture of step (a) in situ with an alkali metal azide under reactive conditions at temperatures in the range of about from −10° to 30°C, thereby yielding the corresponding compound of formula C or C''

## 3,896,140
## IODONIUM COMPOUNDS OF 3,5-DIMETHYLISOXAZOLE

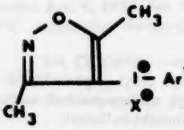
Raymond A. Plepys, and Zdravko Jezic, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 2, 1973, Ser. No. 320,508
Int. Cl. C07d 85/22
U.S. Cl. 260—307 H 5 Claims

1. A compound represented by the formula



or



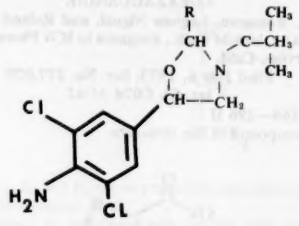
wherein Ar represents thienyl, phenyl or mono-substituted phenyl in which the substituents are selected from lower alkyl, lower alkoxy and phenoxy and wherein Ar' represents monohalophenyl and X represents an anion selected from trifluoroacetate, trichloroacetate, chloride and bromide.

## 3,896,141
## 4-(4'-AMINO-3',5'-DICHLORO-PHENYL)-3-TERTIARY BUTYL-OXAZOLIDINES

Johannes Keck, and Gunther Engelhardt, both of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Mar. 8, 1973, Ser. No. 339,389
Claims priority, application Germany, Mar. 18, 1972, 2213271
Int. Cl. C07d 85/26
U.S. Cl. 260—307 FA 4 Claims

1. A compound of the formula



wherein

R is hydrogen, methyl, ethyl, propyl, isopropyl, n-pentyl, phenyl, 2-chlorophenyl, pyridyl-(4) or styryl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

## 3,896,142
## PROCESS FOR THE PREPARATION OF SUBSTITUTED BENZIMIDAZOLES

Gunther Dransch, Eschborn, Taunus, and Gerhard Horlein, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 11, 1973, Ser. No. 405,400
Claims priority, application Germany, Oct. 14, 1972, 2250469
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 6 Claims

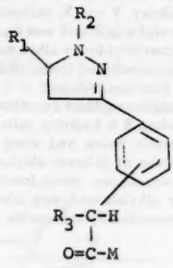
1. A process for the preparation of a 2-benzimidazole-carbamic acid alkyl or benzyl ester or a salt thereof, which comprises reacting a 2-aminobenzimidazole with a base and a carbonic acid dialkyl or dibenzyl ester with exclusion of water to obtain the corresponding 2-benzimidazole alkyl or benzyl carbamate salt.

## 3,896,143
## SUBSTITUTED PYRAZOLYL PHENYLACETIC ACID DERIVATIVES

Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Oct. 18, 1972, Ser. No. 298,604
Int. Cl. C07d 49/10
U.S. Cl. 260—310 D 6 Claims

1. A compound of the formula



wherein

$R_1$ is alkyl of 1 to 5 carbon atoms, phenyl or monosubstituted phenyl in which the substituent is halo of atomic weight 19 to 80, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or trifluoromethyl,

$R_2$ is alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, phenyl or monosubstituted cycloalkyl or phenyl in which the substituent is halo of atomic weight 19 to 80, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or trifluoromethyl,

$R_3$ is hydrogen or alkyl of 1 to 5 carbon atoms,

M is hydroxy, alkoxy of 1 to 5 carbon atoms or

wherein

R′ and R″ are, independently, hydrogen or alkyl of 1 to 3 carbon atoms, and the carbon attached to the phenyl ring is attached to the para- or meta- position of said phenyl ring with respect to the pyrazolyl group, and their pharmaceutically acceptable salts.

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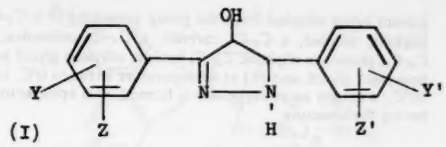
## 3,896,144
## PREPARATION OF 3,5-DIPHENYL-2-PYRAZOLIN-4-OL, 3,5-DIPHENYL-PYRAZOLE AND THE PHENYL-SUBSTITUTED DERIVATIVES THEREOF

Frank Albert Wagner, Jr., Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

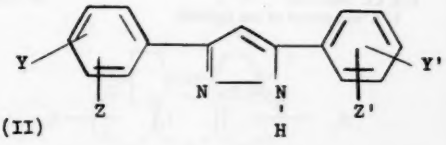
Filed July 13, 1973, Ser. No. 379,031
Int. Cl. C07d 49/10, 49/18
U.S. Cl. 260—310 R 11 Claims

1. A process for the preparation of compounds having a formula selected from the group consisting of:



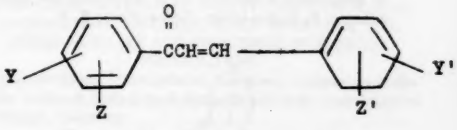
(I)

and



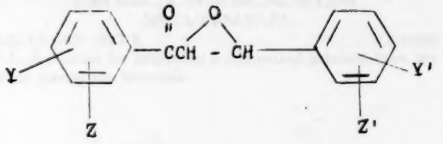
(II)

wherein Y, Y′, Z and Z′ each represents members selected from the group consisting of hydrogen, halogen, nitro, alkyl $C_1$–$C_4$, haloalkyl $C_1$–$C_4$ having 1 to 4 halogens and alkoxy $C_1$–$C_4$; which comprises the steps of: reacting a compound having the formula:



wherein Y, Y′, Z and Z′ are as defined above, with from about 1 to 2 mole equivalents of aqueous hydrogen peroxide, maintaining the pH of said reaction mixture between pH 8 and 11 while carrying out said reaction (a) in the presence of water and an organic solvent with appreciable water solubility, said

solvent being selected from the group consisting of a $C_1$–$C_6$ aliphatic alcohol, a $C_5$–$C_8$ carbitol, a $C_4$–$C_8$ cellosolve, a $C_4$–$C_{10}$ glyme, an aliphatic $C_3$–$C_5$ ketone, ethylene glycol and propylene glycol, and (b) at a temperature between 0°C. and 60°C., whereby an epoxyketone is formed, said epoxyketone having the structure:



wherein Y, Y', Z and A' are as defined above, reacting said epoxyketone in the presence of a water-miscible solvent with from about 1 to 2 mole equivalents of hydrazine, hydrazine monohydrate or an aqueous solution thereof in the presence of from about 1% to 10% by weight of an acid selected from the group consisting of mineral acids and organic sulfonic acids, said reaction being carried out (a) at a temperature between about 20°C. and 100°C., whereby the formula (I) 3,5-diphenyl-2-pyrazolin-4-ol is formed, or (b) at a temperature between about 125°C. and 225°C., whereby the formula (II) 3,5-diphenylpyrazole is formed.

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**3,896,145**

## CARBAZOLES

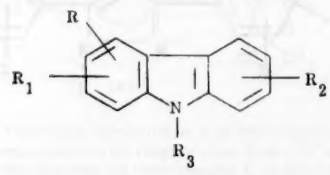
**Leo Berger, Montclair, and Alfred John Corraz, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**Continuation-in-part of Ser. No. 274,142, July 24, 1972, abandoned. This application May 17, 1973, Ser. No. 361,103**

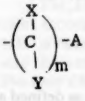
**Int. Cl. C07d** *27/68*

**U.S. Cl. 260—315** **20 Claims**

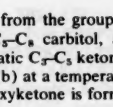
1. A compound of the formula



wherein R is hydrogen, halogen, hydroxy, cyano, lower alkyl, hydroxy-lower alkyl, lower alkoxy, acetyl, benzyloxy, lower alkylthio, trifuloromethyl, carboxy, carbo-lower alkoxy, nitro, amino, mono-lower alkylamino, di-lower alkylamino, sulfamoyl, di-lower alkylsulfamoyl or difluoromethylsulfonyl; $R_1$ is halogen, cyano, hydroxy-lower alkyl, lower alkoxy, acetyl, acetamido, benzyloxy, lower alkylthio, trifluoromethyl, hydroxy, carboxy, carbo-lower alkoxy, nitro, amino, mono-lower alkylamino, di-lower alkylamino, sulfamoyl, di-lower alkylsulfamoyl or difluoromethylsulfonyl; or R taken together with an adjacent $R_1$ is also lower alkylenedioxy; $R_2$ is



wherein A is hydroxy, lower alkoxy, amino-lower alkoxy, mono-lower alkylamino-lower alkoxy or di-lower alkylamino-lower alkoxy, X and Y, independently, are hydrogen or lower alkyl, and *m* is 1 to 7, or $R_2$ is



wherein B is hydroxy, lower alkoxy, amino, hydroxyamino, mono-lower alkylamino, di-lower alkylamino, amino-lower alkoxy, mono-lower alkylamino-lower alkoxy or di-lower alkylamino-lower alkoxy, Y and X, independently, are hydrogen or lower alkyl, and n is 1 to 7 and $R_3$ is hydrogen, lower alkyl, lower alkoxycarbonyl-lower alkyl, carboxy-lower alkyl, lower alkanoyl, halo-substituted lower alkanoyl, benzyl, halobenzyl, benzoyl or halo-benzoyl; and

when X and Y are different, their enantiomers; when R or $R_1$ is carboxy and/or when B is hydroxy, salts thereof with pharmaceutically acceptable bases; and when R or $R_1$ is amino, mono-lower alkylamino or di-lower alkylamino, and/or when B or A is amino-lower alkoxy, mono-lower alkylamino-lower alkoxy or di-lower alkylamino-lower alkoxy, addition salts thereof with pharmaceutically acceptable acids.

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**3,896,146**

## 3,5-DIALKYL-4-HYDROXYPHENYLALKYL SUBSTITUTED TRICYCLIC IMIDES

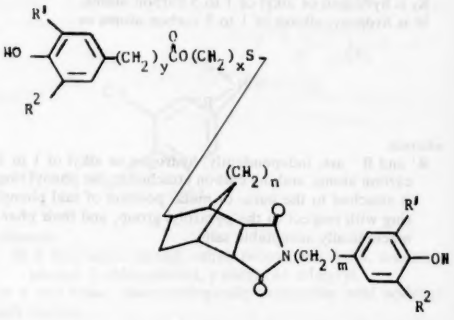
**John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Dec. 28, 1973, Ser. No. 429,233**

**Int. Cl. C07d** *27/48*

**U.S. Cl. 260—326 C** **7 Claims**

1. A compound having the formula



wherein

$R^1$ and $R^2$ are the same or different alkyl groups of 1 to 4 carbon atoms,

*m* has a value of 0 to 3,

*n* has a value of 1 and 2,

*x* has a value of 1 to 6, and

*y* has a value of 1 or 2.

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**3,896,147**

## HINDERED PHENOLIC NORBORNANE-2,3-DICARBOXIMIDES

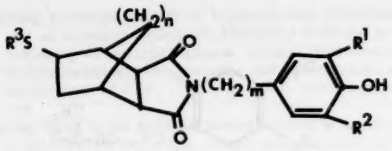
**John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Dec. 28, 1973, Ser. No. 429,234**

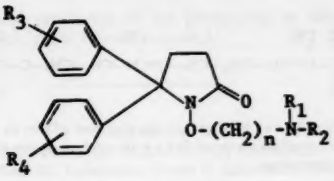
**Int. Cl. C07d** *27/48*

**U.S. Cl. 260—326 C** **11 Claims**

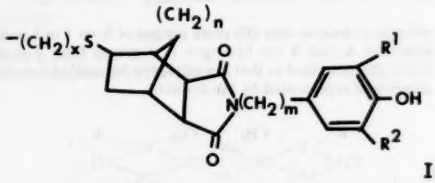
1. A compound of the formula



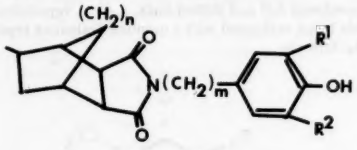
I



wherein
$R^1$ and $R^2$ are the same or different (lower)alkyl groups of 1 to 4 carbon atoms,
$m$ has a value of 0 to 3,
$n$ has a value of 1 or 2, and
$R^3$ is alkyl group of 1 to 18 carbons, a group of the formulae



II



III

or

$$-(CH_2)_p-CO_2R^4 \qquad IV$$

where
$x$ has a value of 2 to 18,
$R^4$ is alkyl of 1 to 18 carbons, and
$p$ has a value of 1 to 2.

in which:
$n$ is two to four;
$R_1$ and $R_2$ are lower alkyl; and
$R_3$ and $R_4$ are hydrogen, halogen, lower alkyl, lower alkoxy or trifluoromethyl.

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**3,896,148**
**1-DIALKYLAMINOALKOXY-5,5-DIPHENYL-2-PYRROLIDINONE COMPOUNDS**
**Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.**
**Filed Jan. 17, 1974, Ser. No. 435,132**
**Int. Cl. C07d** *27/08*
**U.S. Cl. 260—326.5 FL** **3 Claims**

**1. A compound of the formula:**

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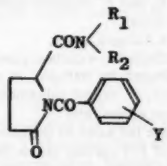
**3,896,149**
**NOVEL PYRROLIDONE DERIVATIVES AND MANUFACTURING THE SAME**
**Akira Kotone, Nara; Yoshiyuki Hiri, and Tadashi Masada, both of Osaka, all of Japan, assignors to Sakai Chemical Industry Company, Limited, Japan**
**Filed June 7, 1973, Ser. No. 367,890**
**Claims priority, application Japan, June 7, 1972, 47-57238**
**Int. Cl. C07d** *27/08*
**U.S. Cl. 260—326.25** **3 Claims**

**1. A pyrrolidone derivative represented by the formula**



**wherein $R_1$ and $R_2$ are the same alkyl group having 1 to 6 carbon atoms or taken collectively form a tetramethylene group and Y is hydrogen or a halogen atom.**

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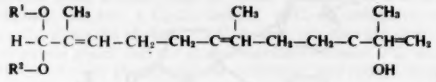
**3,896,150**
**2,6,10-TRIMETHYLDODECA-2,6,11-TRIEN-10-OL-1-AL-2,6-DIMETHYL-2,6-UNDECADIEN-10-ON-1-AL AND THEIR ACETALS AND PROCESSES FOR THEIR PRODUCTION**
**Werner Hoffman, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**
**Filed Aug. 23, 1972, Ser. No. 283,171**
**Claims priority, application Germany, Sept. 2, 1971, 2143991; Sept. 2, 1971, 2143992**
**Int. Cl. C07d** *15/04*
**U.S. Cl. 260—340.7** **4 Claims**

**1. A compound of formula (1):**



(I)

in which $R^1$ and $R^2$ together are alkylene of two to six carbon atoms, cycloalkylene of five or six carbon atoms in the ring, or o-phenylene.

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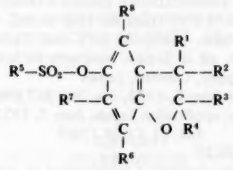
## 3,896,151
## 2-HALO-2,3-DIHYDROBENZOFURAN-5-OLESTERS OF SULFONIC ACIDS

**Peter Stuart Gates, Cambridge, England, assignor to Fisons Limited, London, England**

**Filed Apr. 11, 1974, Ser. No. 460,150**
**Claims priority, application United Kingdom, Apr. 17, 1973, 18395/73**
**Int. Cl. C07d** *5/36*
**U.S. Cl. 260—346.2 R** **10 Claims**

1. A compound of formula:



in which

$R^1$, $R^2$ and $R^3$ are the same or different and each represents hydrogen or alkyl of 1–6 carbon atoms, or $R^1$ and $R^2$ together or $R^2$ and $R^3$ together form an alkylene chain of 2–5 carbon atoms;

$R^4$ represents a halogen atom;

$R^5$ represents alkyl of 1–4 carbon atoms, alkyl of 1–4 carbon atoms substituted by halogen or alkoxy of 1–6 carbon atoms, phenyl, or phenyl substituted by halogen or alkyl of 1–4 carbon atoms; and

$R^6$, $R^7$ and $R^8$ are the same or different and each represents hydrogen, alkyl of 1–4 carbon atoms, halogen, cyano, alkanoyl of 2–6 carbon atoms or alkoxy of 1–4 carbon atoms.

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## 3,896,152
## AZIDES

**Hideo Otsuka, Osaka, and Ken Inouye, Kobe, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**

**Division of Ser. No. 266,748, June 27, 1972, Pat. No. 3,839,395. This application Jan. 8, 1974, Ser. No. 431,603**
**Claims priority, application Japan, July 15, 1971, 46-52707; July 15, 1971, 46-52708; Aug. 19, 1971, 46-63182**
**Int. Cl. C07c** *117/00*
**U.S. Cl. 260—349** **2 Claims**

1. 1-methylcyclohexyl azidoformate.

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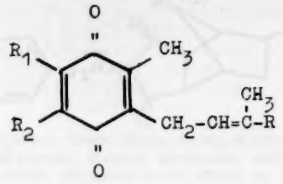
## 3,896,153
## SYNTHESIS OF QUINONE DERIVATIVES HAVING BIOLOGICAL ACTIVITY

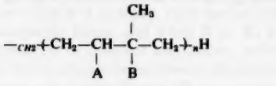
**Kikumasa Sato, Yokohama; Seiichi Inoue, Fujisawa; Shizumasa Kijima, Tokyo, and Kimio Hamamura, Kashiwa, all of Japan, assignors to Eisai Company, Ltd., Japan**

**Filed Mar. 25, 1974, Ser. No. 454,574**
**Claims priority, application Japan, Apr. 6, 1973, 48-38748**
**Int. Cl.² C07C** *49/64, 49/66*
**U.S. Cl. 260—396 R** **6 Claims**

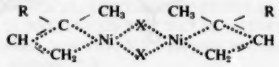
1. A process for the synthesis of quinone derivatives having biological activity represented by the formula:



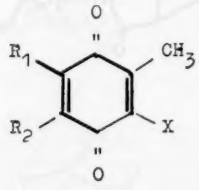
wherein $R_1$ and $R_2$ are methoxy or together with the carbon atoms to which they are attached constitute a benzene ring, and R is



wherein *n* denotes zero (0) or an integer of from 1 to 9 inclusive, and A and B are hydrogen or together form a direct bond, characterized in that a $\pi$-allyl-type halonickel complex compound represented by the formula:



wherein X(s) are halogen, R(s) have the same meanings as aforementioned, and each of the bonds with a single dotted line, , represents a half bond and each of the bonds with the combined full and dotted lines, , represents a half-double bond, is reacted with a quinone derivative represented by the formula:



wherein $R_1$, $R_2$ and X respectively have the meanings as aforedefined, at a temperature of 30° to 80°C and in the presence of an amide-type solvent selected from the group consisting of dimethyl formamide, dimethyl acetamide, hexamethyl phosphoramide, N-methyl pyrrolidone and tetramethyl urea, or a mixed solvent consisting of said amide-type solvent and a non-polar solvent selected from the group consisting of benzene, xylene, and cyclohexane.

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## 3,896,154
## PROCESS FOR PRODUCING ALIPHATIC POLYISOCYANATES

**Yasunobu Takahashi, Nobeoka; Maomi Seko, Tokyo; Akira Ide, Nobeoka; Soziro Matumoto, Nobeoka, and Takashi Nishigaki, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 1, 1973, Ser. No. 412,020**
**Claims priority, application Japan, Nov. 7, 1972, 47-110783**
**Int. Cl.² C07C** *119/042*
**U.S. Cl. 260—453 P** **5 Claims**

1. A process for preparing an aliphatic polyisocyanate which comprises

heating a mixture containing hexamethylene diisocyanate and an aromatic hydrocarbon selected from the group consisting of benzene, toluene, xylene, chlorobenzene, dichlorobenzene, bromobenzene and nitrobenzene, to a temperature of from 100°C. to 140°C under agitation, and

adding water to the resulting heated mixture in an amount of from 3to 2/1 molar ratio of said diisocyanate to water, whereupon reaction of water and said diisocyanate is effected.

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## 3,896,155
## OXIME ETHERS

**Gerhard Hamprecht, Mannheim; Karl-Heinz Koenig, Frankenthal, and Adolf Fischer, Mutterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

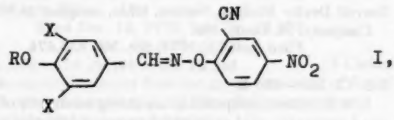
**Filed Apr. 11, 1973, Ser. No. 349,914**

**Claims priority, application Germany, Apr. 22, 1972, 2219802**

**Int. Cl. C07c** *121/78*

**U.S. Cl. 260—465 E** **7 Claims**

1. A compound of the formula

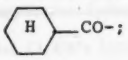


I,

wherein:

X is selected from the group consisting of bromine and iodine; and

R is selected from the group consisting of hydrogen; lithium; sodium; potassium; alkyl of 1 to 3 carbon atoms or said alkyl substituted by chlorine, methoxy or thiomethoxy; alkanoyl of 2 to 3 carbon atoms; chloroacetyl;



benzoyl or said benzoyl substituted by chloro, nitro, methyl, methoxy, thiomethoxy or trifluoromethyl; carboalkoxy of 1 to 4 carbon atoms in the alkoxy group or said carboalkoxy substituted by chlorine, methoxy or thiomethoxy; carbophenoxy or said carbophenoxy substituted by chlorine, nitro, cyano, methyl, methoxy, thiomethoxy or trifluoromethyl; alkylcarbamoyl of 1 to 3 carbon atoms in the alkyl group or said alkyl carbamoyl substituted on the alkyl chain by chlorine, methoxy or thiomethoxy; cyclohexylcarbamoyl; phenylcarbamoyl or said phenylcarbamoyl substituted on the phenyl ring by chlorine, nitro, cyano, methyl, methoxy, thiomethoxy or trifluoromethyl; N-methyl-N-phenyl-carbamoyl; N,N-dimethylcarbamoyl; alkylsulfonyl of 1 to 3 carbon atoms; phenylsulfonyl or said phenylsulfonyl substituted on the phenyl ring by methyl, methoxy, thiomethoxy, chlorine, nitro, cyano or trifluoromethyl; monoalkylsulfamoyl of 1 to 3 carbon atoms; and dimethylsulfamoyl; phenylmethylsulfamoyl or said phenylmethylsulfamoyl substituted on the phenyl ring by chlorine, methyl, nitro, cyano or trifluoromethyl.

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## 3,896,156
## DIHYDROPROSTAGLANDIN E, ANALOGS

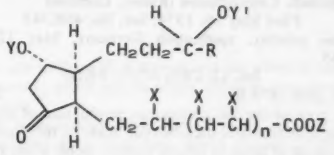
**Philip F. Beal, III, Kalamazoo; Frank H. Lincoln, Jr., Portage, and John E. Pike, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 51,370, June 30, 1970, abandoned, which is a division of Ser. No. 809,046, March 20, 1969, Pat. No. 3,524,867, which is a division of Ser. No. 555,283, June 6, 1966, Pat. No. 3,435,053. This application July 16, 1973, Ser. No. 379,475**

**Int. Cl.² C07C** *61/38, 69/74*

**U.S. Cl. 260—468 D** **8 Claims**

1. An optically active compound of the absolute configuration of natural $PGE_1$ or a racemic compound of the formula:



wherein R is an alkyl group containing from one to eight carbon atoms, inclusive, X is hydrogen or methyl with the proviso that not more than one methyl group can be present in a given side chain, Y and Y' are hydrogen or alkanoyl of one to 12 carbon atoms, inclusive, Z is hydrogen, a hydrocarbyl group of one to 12 carbon atoms, inclusive, or a pharmacologically acceptable cation, and *n* is 0, 1 or 2.

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## 3,896,157
## DIHYDO 2-NAPHTHYLACETIC ACID DERIVATIVES

**John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama City, Panama**

**Division of Ser. No. 694,771, Dec. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 608,997, Jan. 13, 1967, abandoned. This application Nov. 4, 1971, Ser. No. 195,878**

**Int. Cl.² C07C** *69/76*

**U.S. Cl. 260—469** **6 Claims**

1. A compound selected from the group consisting of 3,4-dihydro-6-fluoro-2-naphthyl-α-methylacetic acid, the alkyl esters thereof wherein the alkyl moiety has 1 to 12 carbon atoms, and the pharmaceutically acceptable addition salts thereof.

6. A compound selected from the group consisting of 3,4-dihydro-6-methylthio-2-naphthyl-α-methylacetic acid, the alkyl esters thereof wherein the alkyl moiety has 1 to 12 carbon atoms, and the pharmaceutically acceptable addition salts thereof.

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## 3,896,158
## N,N-DIALKYLALKANOLAMINES

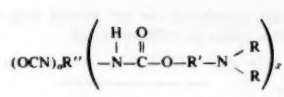
**David E. Rice, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 241,413, April 5, 1972, Pat. No. 3,786,030. This application Oct. 9, 1973, Ser. No. 404,323**

**Int. Cl. C07c** *125/06*

**U.S. Cl. 260—472** **6 Claims**

1. A dialkylaminoalkylurethane of the structure:



where R'' is the isocyanate-free residue of an isocyanate-terminated prepolymer, R' is lower alkylene having 2–5 carbon atoms, R is lower alkyl having 1–6 carbon atoms, *x* is an integer of at least one, and *a* is zero or an integer of at least one.

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3,896,159

## PRODUCTION OF DICARBOXYLIC ACID DIESTERS

**Otto Kratzer, Bobenheim-Roxheim, and Hansjoerg Bipp, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**Filed May 10, 1974, Ser. No. 468,743**

**Claims priority, application Germany, May 12, 1973, 2324165**

**Int. Cl. C07c** *67/06, 69/80*

**U.S. Cl. 260—475 B** **3 Claims**

1. A process for the continuous production of diesters of aliphatic and aromatic dicarboxylic acids or their anhydrides and alcohols of three to fifteen carbon atoms while recycling the alcohol used in excess and in the absence of an esterification catalyst at a temperature of from 150° to 250°C in which the reaction mixture, after water of esterification has been removed, has aqueous alkali added to the point of neutralization to separate the monoester from the diester, the aqueous solution of the monoester salt thus separated is acidified with sulfuric acid to recover the monoester, the diester is washed with water to remove residue of alkali and the diester which has been washed until neutral is treated with steam, wherein there is added to the aqueous solution of the monoester salt prior to, during or after acidification a weight of the alcohol serving for the production of the ester which is from one-half to once the weight of the aqueous solution of the monoester salt, washing of the diester is carried out in two stages, the water of esterification and the aqueous condensate obtained in the final steam treatment are used together or separately for washing the diester and the waste water obtained in the diester washing is used completely for the production of the aqueous alkali.

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3,896,160

## AMIDINOCARBAMATES

**Karl Gaetzi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

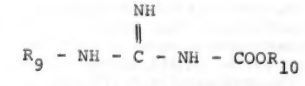
**Filed Mar. 9, 1972, Ser. No. 233,292**

**Claims priority, application Switzerland, Mar. 17, 1971, 3931/71; Feb. 3, 1972, 1612/72**

**Int. Cl. C07c** *125/06*

**U.S. Cl. 260—482 C** **3 Claims**

1. A compound of the formula



in which $R_9$ represents a straight chain alkyl radical containing from 4 to 15 carbon atoms which is interrupted by -NH-, and $R_{10}$ represents methyl or ethyl.

3,896,161

## NOVEL ESTERS OF ALKYLOXY AND ALKARYLOXYPOLYETHYLENE GLYCOLS

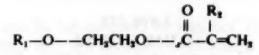
**George Wayne Borden, Charleston, and David John Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.**

**Continuation of Ser. No. 245,182, April 18, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,322**

**Int. Cl. C07c** *69/54*

**U.S. Cl. 260—486 R** **5 Claims**

1. Compounds represented by the formula:



wherein $R_1$ represents alkyl of from 8 to 24 carbon atoms, wherein $R_2$ is hydrogen or methyl, and wherein *x* represents a number having an average value within the range of from 3 to 40.

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3,896,162

## STABLE COMPOSITIONS AND METHODS OF INHIBITING POLYMERIZATION OF UNSATURATED CARBOXYLIC ACID ESTERS

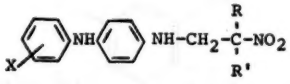
**Darrell Dexter Mullins, Norton, Ohio, assignor to Monsanto Company, St. Louis, Mo.**

**Filed Jan. 23, 1974, Ser. No. 435,676**

**Int. Cl. C07c** *69/54*

**U.S. Cl. 260—486 R** **6 Claims**

1. A monomer composition consisting essentially of unsaturated carboxylic acid ester and, in amount effective to inhibit polymerization of the ester, an inhibitor of the formula



in which R is lower alkyl, R' is hydrogen, nitro or lower alkyl and X is hydrogen, lower alkyl or lower alkoxy.

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3,896,163

## PURIFICATION OF ALIPHATIC PHOSPHONIC ACIDS

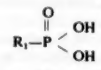
**Albert M. V. Jacques, Norristown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.**

**Filed May 31, 1974, Ser. No. 474,993**

**Int. Cl. C07c** *9/38*

**U.S. Cl. 260—502.4 R** **14 Claims**

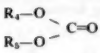
1. A process for separating an aliphatic phosphonic acid, represented by the general formula:



from an aliphatic phosphonic acid half-ester, represented by the general formula:

wherein $R_1$, $R_2$ and $R_3$ are each independently selected from the group consisting of alkyl, alkenyl, halo-substituted alkyl and halo-substituted alkenyl, all having from 1 to 6 carbon atoms, which comprises:

extracting the half-ester from an aqueous crude reaction mixture, comprised of the half-ester and the phosphonic acid, with an alkyl ester of carbonic acid represented by the general formula:



wherein $R_4$ and $R_5$ are each independently alkyl having from 1 to 6 carbon atoms.

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**3,896,164**

## 3-DIHALOMETHYL-1-CARBOXY-1,2,2-TRIMETHYLCYCLOPENTANE

**Cal Yale Meyers, Carbondale, Ill., and Ashok M. Malte, Poona, India, assignors to Southern Illinois University Foundation, Carbondale, Ill.**

**Filed Dec. 14, 1970, Ser. No. 98,079**

**Int. Cl. C07c** *61/06*

**U.S. Cl. 260—514 J** **15 Claims**

**1.** A compound selected from the group consisting of d- and l-3-dihalomethyl-1-carboxy-1,2,2-trimethylcyclopentanes wherein halo is chlorine or bromine.

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**3,896,165**

## BENZOIC ACID DERIVATIVES

**Peter Werner Feit, Gentofte, and Ole Bent Tvaermose Nielsen, Vanlose, both of Denmark, assignors to Lovens Kemiske Fabrick Produktionsaktieselskab, Ballerup, Denmark**

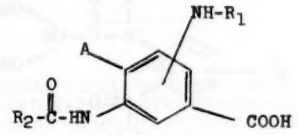
**Division of Ser. No. 149,012, June 1, 1971, Pat. No. 3,819,692. This application Oct. 25, 1973, Ser. No. 409,394**

**Claims priority, application United Kingdom, June 18, 1970, 29740/70**

**Int. Cl. C07c** *103/12*

**U.S. Cl. 260—517** **2 Claims**

**1.** Compounds of the general formula I



I

in which $R_1$ is selected from the group consisting of alkyl radicals with from 3 to 8 carbon atoms in the carbon chain, and phenyl substituted methyl and ethyl; A is benzoyl; $R_2$ is selected from the group consisting of hydrogen and lower alkyl groups; and pharmaceutically acceptable salts of the carboxylic acid of formula I.

**3,896,166**

## FORMYL-SUBSTITUTED TYROSINE

**Ado Kaiser, Lausen, Switzerland; Hermann Bretschneider, and Kraft Hohenlohe-Oehringen, both of Innsbruck, Austria, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

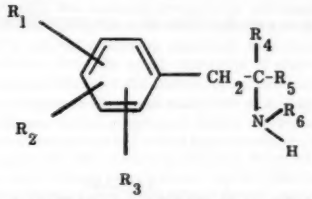
**Continuation-in-part of Ser. No. 139,297, April 28, 1971, Pat. No. 3,763,218. This application June 27, 1973, Ser. No. 374,146**

**Claims priority, application Switzerland, May 6, 1970, 6806/70**

**Int. Cl.² C07C** *103/30*

**U.S. Cl. 260—519** **11 Claims**

**1.** A compound selected from the group consisting of compounds of the formula:



wherein one of $R_1$ or $R_2$ is formyl and the other of said $R_1$ or $R_2$ is hydroxy, which can be either ortho or para to said formyl; $R_3$ and

$R_4$ are independently hydrogen or lower alkyl; $R_5$ is carboxyl and $R_6$ is hydrogen, lower alkanoyl, benzoyl or naphthoyl

and pharmaceutically acceptable salts thereof.

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**3,896,167**

## PERFLUORINATED LINEAR POLYETHERS

**Dario Sianesi; Adolfo Pasetti, and Costante Corti, all of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy**

**Continuation of Ser. No. 254,612, May 18, 1972, abandoned, which is a division of Ser. No. 31,852, May 1, 1970, Pat. No. 3,699,145, which is a continuation of Ser. No. 650,257, June 30, 1967, abandoned, which is a continuation-in-part of Ser. No. 446,292, April 7, 1965, Pat. No. 3,442,942. This application Aug. 30, 1973, Ser. No. 393,179**

**Int. Cl. C07C** *53/34, 53/36*

**U.S. Cl. 260—544 F** **2 Claims**

**1.** A linear perfluorinated polyether formed of molecules having a chain structure consisting of a $—C_3F_6—O—$ repeating unit and at least one repeating unit selected from the group consisting of

and $CF_2—O—$ units, said repeating units being linked one to another either directly or through an oxygen atom in which latter case there is a peroxy linkage, the sum of the repeating units present along the chain being from 2 to 100, the ratio of the sum of the total $—CF_2—O—$ units and total

units to the total $-C_3F_6-O-$ units being from 0.02 to 2, and the ratio of total active peroxidic oxygen units to the total $-C_3F_6-O-$ units being from zero to 1, said chain having as terminal groups at one end a $CF_3-O-$ radical linked to said chain through a carbon atom and at the other end a radical selected from the group consisting of $-CH_2COF$ and

linked to said chain through a non-peroxidic oxygen atom.

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**3,896,168**

## METHOD OF MAKING CARBAMOYL SULFOXIDE DERIVATIVES

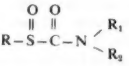
**Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.**

**Continuation of Ser. No. 280,364, Aug. 14, 1972, abandoned. This application June 13, 1973, Ser. No. 369,676**

**Int. Cl.[2] C07C** *103/32, 147/14*

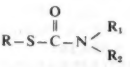
**U.S. Cl. 260—551 R** **1 Claim**

1. A process of manufacturing a herbicidally active compound having the formula:



wherein R and $R_1$ is lower alkyl and $R_2$ is selected from phenyl and benzyl; comprising the steps of:

a. reacting an oxidizing agent selected from m-chloroperoxy benzoic acid with a thiocarbamate in the presence of a solvent, said thiocarbamate having the formula:



wherein R, $R_1$ and $R_2$ have been previously defined;

b. said reaction being carried out at a temperature of between −25°C and 25°C;

c. said oxidizing agent being present in an amount of at least one molar equivalent.

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**3,896,169**

## METHOD OF MAKING CARBONOYL SULFOXIDE DERIVATIVES

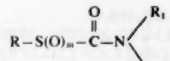
**Harry Tilles, El Cerrito, and John E. Casida, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.**

**Continuation-in-part of Ser. No. 280,371, Aug. 14, 1972, abandoned. This application June 18, 1973, Ser. No. 371,326**

**Int. Cl.[2] C07C** *103/32, 103/56, 147/14*

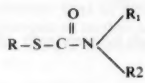
**U.S. Cl. 260—551 R** **2 Claims**

1. A process for manufacturing a pesticidal compound corresponding to the following formula:



wherein *n* is 1 or 2; R is selected from the group consisting of lower alkyl, lower haloalkyl, lower alkoxyalkenyl and lower alkenyl; $R_1$ and $R_2$ can be the same or different and are selected from the group consisting of lower alkyl, cyclohexyl, lower alkylcyclohexyl, lower alkenyl and lower alkynyl; comprising the steps of:

a. combining an oxidizing agent selected from peracetic acid and m-chloroperoxybenzoic acid and a thiocarbamate compound in a solvent system; said thiocarbamate having the following formula:



wherein R, $R_1$ and $R_2$ have been defined above;

b. maintaining the temperature between −15°C. and 60°C.;

c. said oxidizing agent being present in an amount of at least one stoichiometric equivalent and not more than two stoichiometric equivalents.

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**3,896,170**

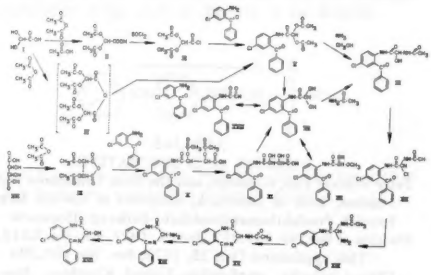
## INTERMEDIATES FOR THE PREPARATION OF 1,3-DIHYDRO-2H-1, -BENZODIAZEPIN-2-ONES

**Ronald J. McCaully, 26 Buck Run Ln., Malvern, Pa. 19355, assignor to American Home Products Corporation, New York, N.Y.**

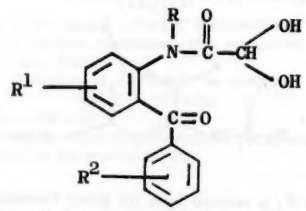
**Division of Ser. No. 802,345, Feb. 6, 1969, Pat. No. 3,763,171. This application Feb. 15, 1973, Ser. No. 332,983**

**Int. Cl. C07c** *103/42*

**U.S. Cl. 260—562 P** **4 Claims**



1. A compound of the structure:



wherein R is hydrogen, methyl, ethyl, propyl, allyl, methyl allyl, benzyl or phenylethyl; $R^1$ is hydrogen, lower alkyl, chlorine, bromine, trifluoromethyl, nitro, or methylsulfonyl; and

$R^2$ is hydrogen, lower alkyl, chlorine, bromine, trifluoromethyl, nitro or methyl sulfonyl.

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3,896,171

## 1-DODECYLAMINOMETHYL-2-AMINO-CYCLOPENTANE

Ulrich Holtschmidt, Essen, and Günter Schwarzmann, Essen-Uberruhr, both of Germany, assignors to Th. Goldschmidt AG, Germany

Filed July 30, 1973, Ser. No. 383,679

Claims priority, application Germany, Sept. 13, 1972, 2244778

Int. Cl.[2] C07C *87/38*

U.S. Cl. 260—563 R 1 Claim

1. 1-dodecylaminomethyl-2-amino-cyclopentane.

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3,896,172

## PREPARATION OF AMINO-DIPHENYLSULFIDES

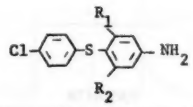
Banavara L. Mylari, Waterford, and Thomas M. Brennan, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 342,969, March 20, 1973, Pat. No. 3,852,289. This application Apr. 2, 1974, Ser. No. 457,196

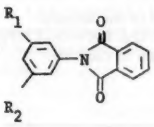
Int. Cl. C07c *87/50*, *87/60*

U.S. Cl. 260—578 4 Claims

1. A process for the preparation of compounds of the formula:



wherein $R_1$ is selected from the group consisting of hydrogen and methyl; and $R_2$ is selected from the group consisting of methyl and chloro, which comprises contacting p-chlorophenylsulfenyl chloride with a compound of the formula:



in the presence of a reaction-inert solvent at a temperature of 25°–110° C., and thereafter removing the phthaloyl moiety.

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3,896,173

## TWO STAGE CATALYTIC HYDROGENATION OF UNSATURATED DINITRILES EMPLOYING RUTHENIUM, NICKEL OR MIXTURE THEREOF AS CATALYTIC AGENT

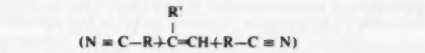
Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,784

Int. Cl. C07c *87/14*

U.S. Cl. 260—583 P 18 Claims

1. A process for the catalytic hydrogenation of an unsaturated dinitrile feedstock comprising at least one unsaturated dinitrile compound of the formula:



wherein each R is independently selected from the group consisting of an alkylene radical and an alkylidene radical, R' is an alkyl radical, and the number of carbon atoms in said compound is in the range of 7 to 30; which comprises contacting said feedstock under suitable hydrogenation conditions in a first stage reaction zone with ammonia; hydrogen; at least one diluent selected from the group consisting of unsubstituted alkanols having from 1 to 12 carbon atoms per molecule, saturated hydrocarbons having from 4 to 12 carbon atoms per molecule, and unsubstituted acyclic and unsubstituted cyclic ethers having from 4 to 12 carbon atoms per molecule; and a catalyst consisting essentially of a catalytic component selected from the group consisting of elemental ruthenium, elemental nickel, ruthenium compounds which are reducible by hydrogen to elemental ruthenium at said hydrogenation conditions, nickel compounds which are reducible by hydrogen to elemental nickel at said hydrogenation conditions, and mixtures thereof; removing ammonia from the first stage reaction zone effluent to provide an intermediate unsaturated diamine product at least substantially free of ammonia; and contacting said intermediate unsaturated diamine product under suitable hydrogenation conditions in a second stage reaction zone with hydrogen, at least one of said diluents, and at least one of said catalysts to thereby effect the at least substantially complete hydrogenation of said at least one unsaturated dinitrile compound to the corresponding branched-chain saturated diamine product.

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3,896,174

## CATALYTIC HYDROGENATION OF UNSATURATED DINITRILES EMPLOYING RUTHENIUM, NICKEL OR MIXTURE THEREOF AS CATALYTIC AGENT

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,785

Int. Cl.[2] C07C *87/14*

U.S. Cl. 260—583 P 16 Claims

1. A single stage reaction process for the catalytic hydrogenation of an unsaturated dinitrile feedstock comprising at least one unsaturated dinitrile compound of the formula

wherein each R is independently selected from the group consisting of an alkylene radical and an alkylidene radical, R' is an alkyl radical, and the number of carbon atoms in said compound is in the range of 7 to 30; which comprises contacting said feedstock under suitable hydrogenation conditions in a single stage reaction zone with ammonia; hydrogen; and a catalyst consisting essentially of a catalytic component selected from elemental ruthenium, elemental nickel, ruthenium compounds which are reducible by hydrogen to elemental ruthenium at said hydrogenation conditions, nickel compounds which are reducible by hydrogen to elemental nickel at said hydrogenation conditions, and mixtures thereof; in a diluent consisting essentially of at least one component selected from the group consisting of unsubstituted tertiary alkanols having from 4 to 12 carbon atoms per molecule, unsubstituted acyclic and unsubstituted cyclic ethers having from 4 to 12 carbon atoms per molecule, and saturated hydrocarbons having from 4 to 12 carbon atoms per molecule, said diluent consisting essentially of at least one of said alkanols or said saturated hydrocarbons when said catalyst consists essentially of elemental ruthenium or a ruthenium compound which is reducible by hydrogen to elemental ruthenium at said hydrogenation conditions and consisting essentially of at least one of said alkanols or said ethers when said catalyst consists

essentially of elemental nickel or a nickel compound which is reducible by hydrogen to elemental nickel at said hydrogenation conditions; to thereby effect the at least substantially complete hydrogenation of said at least one unsaturated dinitrile compound to the corresponding branched-chain saturated aliphatic diamine.

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**3,896,175**

**3,7-DIMETHYL-OCTA-2,6-DIENYL-MERCAPTAN**

**Daniel Helmlinger, Dubendorf; Dietmar Lamparsky, Wangen-Dubendorf; Peter Schudel, Grut; Jost Wild, Zurich, and Trudi Sigg-Grutter, Winterthur, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.**

**Filed May 8, 1972, Ser. No. 251,060**

**Claims priority, application Switzerland, Mar. 17, 1972, 7772/71**

**Int. Cl.[2] C07c** *149/08*

**U.S. Cl. 260—609 R** **1 Claim**

1. 3,7-Dimethyl-octa-2,6-dienyl-mercaptan.

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**3,896,176**

**ORGANIC PEROXIDES DERIVED FROM UNSATURATED COMPOUNDS**

**Egeo Sacrini, and Claudio Cavallotti, both of Milan, Italy, assignors to The BF Goodrich Company, Akron, Ohio**

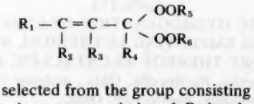
**Filed July 8, 1970, Ser. No. 53,267**

**Claims priority, application Italy, Apr. 11, 1970, 20222/69**

**Int. Cl. C07c** *73/00*

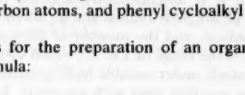
**U.S. Cl. 260—610 R** **8 Claims**

1. An organic peroxide having the formula:

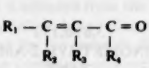


wherein $R_1$ is selected from the group consisting of cycloalkyl having 5–30 carbon atoms and phenyl; $R_2$ is selected from the group consisting of hydrogen, alkyl having 1–12 carbon atoms, and phenyl; and $R_1$ and $R_2$ together with the carbon atom to which they are bonded may form a cycloaliphatic hydrocarbon ring having 5–30 carbon atoms; $R_3$ and $R_4$ are each selected from the group consisting of hydrogen, alkyl having 1–12 carbon atoms, and phenyl; and $R_3$ and $R_4$ taken together with the two adjacent carbon atoms to which they are respectively bonded may form a cycloaliphatic hydrocarbon ring having 5–25 carbon atoms; and $R_5$ and $R_6$ are each selected from the group consisting of alkyl having 4–12 carbon atoms, phenylalkyl having 9–18 carbon atoms, cycloalkyl having 5–21 carbon atoms, and phenyl cycloalkyl having 9–25 carbon atoms.

3. A process for the preparation of an organic peroxide having the formula:



wherein $R_1$ is selected from the group consisting of cycloalkyl having 5–30 carbon atoms and phenyl; $R_2$ is selected from the group consisting of hydrogen, alkyl having 1–12 carbon atoms, and phenyl; and $R_1$ and $R_2$ together with the carbon atom to which they are bonded may form a cycloaliphatic hydrocarbon ring having 5–30 carbon atoms; $R_3$ and $R_4$ are each selected from the group consisting of hydrogen, alkyl having 1–12 carbon atoms, and phenyl; and $R_3$ and $R_4$ taken together with the two adjacent carbon atoms to which they are respectively bonded may form a cycloaliphatic hydrocarbon ring having 5–25 carbon atoms; and $R_5$ and $R_6$ are each selected from the group consisting of alkyl having 4–12 carbon atoms, phenylalkyl having 9–18 carbon atoms, cycloalkyl having 5–21 carbon atoms and phenylcycloalkyl having 9–25 carbon atoms, this process comprising reacting a hydroperoxide selected from the group consisting of $R_5OOH$ and $R_6OOH$, wherein $R_5$ and $R_6$ are as defined above, with an unsaturated carbonyl compound having the formula:



wherein $R_1$, $R_2$, $R_3$, $R_4$ are as defined above dissolved in a solvent in the presence of a sulfonic acid catalyst at a temperature between about −30° and +80°C, the molar ratio of said carbonyl compound to said hydroperoxide being between about 1:2 and 1:10.

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**3,896,177**

**1-CHLORO-1-HYDROPERFLUOROPROPYL DIFLUOROMETHYL ETHER**

**Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.**

**Division of Ser. No. 187,582, Oct. 7, 1971, Pat. No. 3,784,706. This application Aug. 10, 1973, Ser. No. 387,563**

**Int. Cl. C07c** *43/00*

**U.S. Cl. 260—614 F** **1 Claim**

1. l-chloro-l-hydroperfluoropropyl difluoromethyl ether of the formula

$$CF_3—CF_2—CHCl—O—CHF_2.$$

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**3,896,178**

**INHALANT ANESTHETIC COMPOSITIONS AND METHOD**

**Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc., Montvale, N.J.**

**Division of Ser. No. 159,512, July 2, 1971, Pat. No. 3,769,433. This application July 18, 1973, Ser. No. 380,419**

**Int. Cl. C07c** *43/00, 43/12*

**U.S. Cl. 260—614 F** **3 Claims**

1. The compounds of the formula:

$$CHF_2CHX—O—CHF_2$$

wherein X is hydrogen or chlorine.

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**3,896,179**

**DECOMPOSITION OF UNSTABLE ISOMERS**

**Paul Raphael Resnick, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 44,111, June 8, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,882**

**Int. Cl. C07c** *41/12*

**U.S. Cl. 260—616** **4 Claims**

1. Process for preparing substantially pure primary isomer from a mixture of primary and secondary and/or tertiary isomers wherein said isomers are represented by the formula $ROCF=CF_2$ where R is a perfluorinated alkyl radical having 3 to 7 carbon atoms, and wherein the primary isomer is one in which the $—OCF=CF_2$ is connected to a $>CF_2$ group in R, the secondary isomer is one in which the $—OCF=CF_2$ is connected to a $>CF$ group in R and the tertiary isomer is one in which the $—OCF=CF_2$ is connected to a

carbon bearing no fluorine atoms, which comprises heating a mixture consisting essentially of said isomers in which the combined concentration of secondary and/or tertiary isomers present is at least 0.6 percent and less than 16.7 percent by weight of the mixture at a temperature of between 250° and 350°C. for a time sufficient to selectively destroy the secondary and/or tertiary isomers until the combined concentration of the secondary and/or tertiary isomers is below 0.6 percent by weight of the mixture.

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3,896,180

## CYCLODODECADIENEOLS AND THEIR PREPARATION

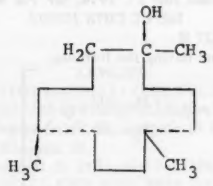
Seymour Lemberg, Elizabeth, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 551,675, May 20, 1966, abandoned. This application Feb. 27, 1974, Ser. No. 446,143

Int. Cl. C07c *35/02*

U.S. Cl. 260—617 M 3 Claims

1. Compounds of the formula



wherein the dashed lines represent single or double bonds.

3. A method of preparing 1,5,9-trimethylcyclododeca-4,8-dien-1-ol which comprises the step of reacting 1,5,9-trimethylcyclododecatriene-1,5,9 with an organic percarboxylic acid under anhydrous conditions in the presence of an alkaline reagent to form 1,5,9-trimethyl-13-oxabicyclo[10.1.0]-trideca-4,8-diene and reducing said trideca-4,8-diene compound with an alkalli metal hydride to form 1,5,9-trimethylcyclododeca-4,8-dien-1-ol.

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3,896,181

## PROCESS FOR PRODUCING CHLOROPRENE

Peter John Nicholas Brown, Epsom, and Clifford William Capp, Ewell, both of England, assignors to BP Chemicals International Limited, London, England

Filed Oct. 11, 1973, Ser. No. 405,324

Claims priority, application United Kingdom, Oct. 26, 1972, 49350/72

Int. Cl. C07c *17/34*, *21/20*

U.S. Cl. 260—655 10 Claims

1. A process for producing chloroprene comprising dehydrochlorinating 3,4-dichlorobutene-1 in a substantially non-aqueous environment by contact with a metal alkoxide wherein the alcohol moiety in the alkoxide has between 3 and 20 carbon atoms.

3,896,182

## PROCESS FOR PREPARING VINYL CHLORIDE BY THE PYROLYSIS OF 1,2-DICHLORO-ETHANE

Donald Peter Young, South Croydon, England, assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 160,172, July 6, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,394

Int. Cl. C07c *21/02*

U.S. Cl. 260—656 R 3 Claims

1. A process for the production of vinyl chloride comprising substantially removing oxygen from 1,2-dichloroethane and the reaction system so that said reaction system contains no more than 2.0 parts per million of oxygen and pyrolysing said 1,2-dichloroethane at elevated temperatures in the range of about 250° to 600°C.

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3,896,183

## PROCESS FOR THE LIQUID PHASE CHLORINATION OF C6–C18 ALPHA-OLEFIN HYDROCARBONS

Albert J. Henderson, Corapolis, and John E. Krol, Moon Twp., both of Pa., assignors to Neville Chemical Company, Pittsburgh, Pa.

Filed Mar. 11, 1974, Ser. No. 449,756

Int. Cl. C07c *17/06*

U.S. Cl. 260—660 15 Claims

1. An improved process for the production of chlorinated hydrocarbons containing about 20 to 73 percent chlorine by weight comprising chlorinating in the absence of a Lewis acid catalyst a hydrocarbon mixture which is a liquid at room temperature containing on the average 6 to 18 carbon atoms per molecule and consisting mainly of normal alpha-olefins while present in the liquid state at a temperature of about 25° to 120°C. in a reaction zone wherein a gaseous mixture comprising a minor proportion of hydrocarbon vapor and gaseous chlorine exists in contact with said liquid hydrocarbon during at least a portion of the chlorination reaction while providing in said reaction zone about 2 to 20 percent by weight based upon the weight of said hydrocarbon mixture of an additive selected from the group consisting of carbon tetrachloride, chloroform, ethylene dichloride, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and perchloroethane and with no solvent for said hydrocarbon mixture being present in said reaction zone other than said minor concentration of said additive which primarily serves a role other than a solvent and which is at least partially volatilized and present in said gaseous mixture in contact with said liquid hydrocarbon where it serves to eliminate an undesirable reaction between said hydrocarbon vapor and said gaseous chlorine thereby improving the quality of the resulting chlorinated hydrocarbon product, and thereafter substantially removing said additive from said chlorinated hydrocarbon product.

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3,896,184

## POLYMERS OF BENZANTHRACENE AS ACTIVE MATRIX MATERIALS

John Alf Bergfjord, Macedon; Richard William Radler, Marion, and Richard Phillip Millonzi, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 27, 1973, Ser. No. 374,163

Int. Cl. C07c *15/20*

U.S. Cl. 260—669 QZ 10 Claims

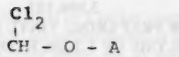
1. A process for producing a vinyl substitued aromatic polycyclic compound of the formula

$$Q - CH = CH_2$$

comprising contacting a corresponding reactant represented by the formula:

$$Q - H$$

with at least a molar amount of a haloalkyl ether of the formula



in the presence of a catalytic amount of $SnCl_4$ or $TiCl_4$

wherein Q is defined as a polycyclic group having at least 4 fused ring nuclei; and

A is individually defined as an alkyl group;

to obtain a corresponding polycyclic aldehyde intermediate represented by the formula

and then contacting the aldehyde intermediate with a reactive amount of a phosphine compound represented by the formulae

$$(Y)_3 - P = CH_2 \qquad (Y)_3P^{(+)}—CH_2^{(-)}$$

in which Y is defined as a phenyl or an alkyl group; to obtain the corresponding vinyl substituted polycyclic compound.

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**3,896,185**

**FLAME RESISTANT MOLDING RESIN COMPOSITION**

**Eiichi Yonemitsu, Chiba; Seiichi Kamiyama; Toshiaki Kanada, and Norio Nagai, all of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Continuation-in-part of Ser. No. 382,122, July 24, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,244**

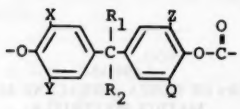
**Claims priority, application Japan, July 29, 1972, 47-755-36**

**Int. Cl. C08g** *39/10*

**U.S. Cl. 260—873** **6 Claims**

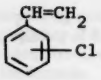
**1.** A resin composition high in flame resistance and excellent in mechanical properties and moldability comprising:

A. a polycarbonate resin having repeating units represented by the formula,



wherein X, Y, Z and Q are individually one member selected from hydrogen, chlorine and bromine atoms, provided that not all of them are hydrogen atoms at the same time, and that in case one of the substituents X to Q is a chlorine or bromine atoms, the other 3 substituents are not bromine or chlorine atoms; and $R_1$ and $R_2$, which be the same or different, are individually a hydrogen atom or an alkyl group having 5 or less carbon atoms, and having an intrinsic viscosity in the range from 0.40 to 1.0 in methylene chloride at 20°C, and

B. a rubber-modified nucleus-chlorinated styrene resin having repeating units derived from a nucleus-chlorinated styrene represented by the formula



and repeating units derived from a member selected from the group consisting of a vinyl cyanide and a methacrylic acid ester of an alkyl alcohol having at most 12 carbon atoms, which has been modified with a rubbery polymer derived from a conjugated diene monomer selected from the group consisting of butadiene and isoprene, wherein comprising 90 to 20 percent by weight of said polycarbonate resin and 10 to 80 percent by weight of said rubber-modified nucleus-chlorinated styrene resin.

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**3,896,186**

**CYCLIC O,O,S-TRIESTERS OF PHOSPHORODITHIOIC ACID**

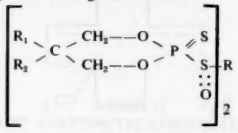
**Walter Nudenberg, Newtown, Conn.; Merlin P. Harvey, Denison, Iowa, and James Urquhart Mann, Wayne, N.J., assignors to Uniroyal, Inc., New York, N.Y.**

**Division of Ser. No. 282,640, Aug. 21, 1972, which is a division of Ser. No. 66,870, Aug. 25, 1970, Pat. No. 3,712,878. This application July 17, 1974, Ser. No. 489,220**

**Int. Cl. C07d** *105/04*

**U.S. Cl. 260—927 R** **3 Claims**

**1.** A compound having the formula:



wherein $R_1$ and $R_2$ are $C_1$ to $C_5$ alkyl groups which can be the same or different; the O portion represents the optional presence of an oxygen atom; and R is 2,5-norbornylene.

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**3,896,187**

**POLY(HALOETHYL-ETHYLENEOXY) PHOSPHORIC ACID ESTER POLYMERS**

**Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.**

**Continuation-in-part of Ser. No. 164,928, July 21, 1971, abandoned, which is a continuation of Ser. No. 760,988, Sept. 19, 1968, abandoned. This application Oct. 25, 1973, Ser. No. 409,486**

**Int. Cl. C07f** *9/08*

**U.S. Cl. 260—928** **2 Claims**

**1.** Liquid poly(chloroethylethyleneoxy) phosphoric acid esters which are prepared by reacting tris(2-chloroethyl) phosphate by heating said phosphate to a temperature within the range of from about 140° to about 220°C. in the presence of a basic catalyst with ethylene dichloride as reaction byproduct; and terminating said reaction at a reaction byproduct level of ethylene dichloride in an amount of from about 0.5 mole to about 0.9 mole ethylene dichloride per mole of tris(2-chloroethyl) phosphate in said reaction.

**2.** The product of claim 1 which further includes the step of post treating the reaction product with an alkylene oxide to neutralize the acidity in said product.

## 3,896,188
## N-CYANOPHOSPHORUS IMIDES

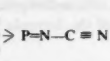
**Ronald A. Mitsch, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 202,667, Nov. 26, 1971, Pat. No. 3,776,950, which is a continuation-in-part of Ser. No. 808,656, March 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 482,585, Aug. 25, 1965, abandoned. This application Dec. 3, 1973, Ser. No. 421,356**

**Int. Cl. C07f** *9/02*

**U.S. Cl. 260—940** **11 Claims**

1. Compounds having the formula



wherein each R is alkyl having 1 to 16 carbon atoms, alkenyl having two to 6 carbon atoms, aryl having 6–14 carbon atoms, alkaryl having 7–12 carbon atoms, aralkyl having 7 to 15 carbon atoms or cycloalkyl having 3–6 carbon atoms; Y is halogen, nitro, cyano, carbonyl, acyl, carboalkoxy, hydroxy and alkoxy; *n* is zero to 3, provided that when R is methyl, *n* is zero or one and when R is alkenyl, *n* is 0; and two of said R-O-groups when alkyl, alkoxy, alkylmercapto or alkoxy-alkyl when taken together with each other and the phosphorus atom can form a 5 to 6 membered ring system having a total of up to 12 carbon atoms; of which 4 carbon atoms can form part of an aromatic ring fused to the said 5–6 membered ring.

## 3,896,189
## S-(2-METHOXYIMINOETHYL) O-ETHYL-N-ISOPROPYL-THIOLO-PHOSPHORAMIDATE

**Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.**

**Filed Sept. 5, 1972, Ser. No. 286,486**

**Int. Cl. C07f** *9/24;* **A01n** *9/36*

**U.S. Cl. 260—944** **1 Claim**

1. The compound S-(2-methoxyiminoethyl) O-ethyl N-isopropylthiolophosphoramidate.

## 3,896,190
## SULFUROUS PHOSPHORIC AND PHOSPHONIC ESTERS

**Peter Beutel, Mannheim; Heinrich Adolphi, Limburgerhof, and Karl Kiehs, Lampertheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

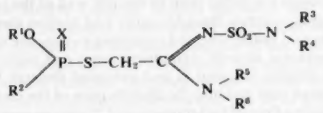
**Filed Oct. 10, 1973, Ser. No. 405,157**

**Claims priority, application Germany, Oct. 12, 1972, 2249939**

**Int. Cl. C07f** *9/16, 9/38;* **A01n** *9/36*

**U.S. Cl. 260—945** **2 Claims**

1. A phosphoric ester of the formula



where $R^1$ denotes methyl or ethyl, $R^2$ denotes methyl, ethyl, phenyl, methoxy or ethoxy, $R^3$ denotes alkyl of a maximum of 3 carbon atoms, $R^4$ denotes hydrogen or alkyl of a maximum of 3 carbon atoms, $R^5$ denotes alkyl of a maximum of 3 carbon atoms, $R^6$ denotes methyl, ethyl or phenyl, and X denotes oxygen or sulfur.

## 3,896,191
## O-ETHYL-S-N-PROPYL-O-(2,6-DICHLORO-4-BROMO-PHENYL)PHOSPHOROTHIOLATE

**Jozef Drabek, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

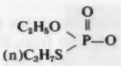
**Filed Dec. 20, 1973, Ser. No. 426,777**

**Claims priority, application Switzerland, Dec. 22, 1972, 18732/72**

**Int. Cl. A01n** *9/36;* **C07f** *9/18*

**U.S. Cl. 260—964** **1 Claim**

1. Compound of the formula



## 3,896,192
## PROCESS FOR THE PREPARATION OF THIONOPHOSPHORIC AND THIONOPHOSPHONIC ACID ESTERS

**Richard Sehring, and Wolfgang Buck, both of Ingelheim, Rhein am Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany**

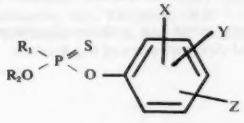
**Continuation-in-part of Ser. No. 329,463, Feb. 5, 1973, abandoned. This application Aug. 2, 1973, Ser. No. 385,065**

**Claims priority, application Germany, Feb. 7, 1972, 2205565; May 9, 1972, 2222578**

**Int. Cl.² C07F** *9/165, 9/40*

**U.S. Cl. 260—982** **5 Claims**

1. A process for the preparation of a compound of the formula



wherein

$R_1$ is lower alkyl, chloro-lower alkyl, phenyl, halophenyl, lower alkyl-phenyl or R—O—,

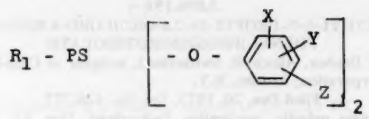
where R is alkyl of 1 to 12 carbon atoms, alkoxyalkyl of 2 to 12 carbon atoms, alkenyl of 3 to 12 carbon atoms, or (alkyl of 1 to 12 carbon atoms)—COOR′, where R′ is lower alkyl,

$R_2$ is lower alkyl,

X and Y, which may be identical or different from each other, are each hydrogen, chlorine, bromine, iodine, lower alkyl or nitro, and

Z is hydrogen, chlorine, bromine, iodine, lower alkyl, nitro, cyano, acetyl or $-S(O)_n-R''$, where R″ is lower alkyl and *n* is 0, 1 or 2,

which comprises subjecting a thionophosphoric or thionophosphoric acid diphenyl ester of the formula

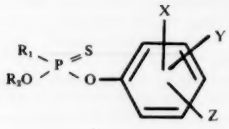


wherein $R_1$, X, Y and Z have the meanings previously defined, to an ester exchange reaction at room temperature or below with a lower alkanol of the formula

$$R_2OH$$

wherein $R_2$ has the meanings defined above, in the presence of an equimolar amount of a base selected from the group consisting of alkali metal alcoholate of said lower alkanol, alkali metal hydroxides and tertiary amines.

4. In a process for the preparation of a compound of the formula



wherein

$R_1$ is lower alkyl, chloro-lower alkyl, phenyl, halophenyl, lower alkyl-phenyl or R-O,

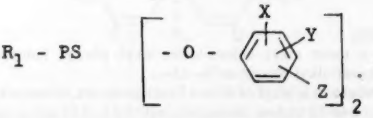
where R is alkyl of 1 to 12 carbon atoms, alkoxyalkyl of 2 to 12 carbon atoms, alkenyl of 3 to 12 carbon atoms, or (alkyl of 1 to 12 carbon atoms)—COOR′, where R′ is lower alkyl,

$R_2$ is lower alkyl,

X and Y, which may be identical or different from each other, are each hydrogen, chlorine, bromine, iodine, lower alkyl or nitro, and

Z is hydrogen, chlorine, bromine, iodine, lower alkyl, nitro, cyano, acetyl or $-S(O)_n-R''$, where R″ is lower alkyl and *n* is 0, 1 or 2,

which comprises subjecting a thionophosphoric or thionophosphoric acid diphenyl ester of the formula



wherein $R_1$, X, Y and Z have the meanings previously defined, to an ester exchange reaction with a lower alkanol of the formula

$$R_2OH$$

wherein $R_2$ has the meanings defined above, the improvement which consists in performing the transesterification at −20° to +100°C in the presence of gaseous ammonia.

**3,896,193**

## PROCESS FOR PREPARING N-ACTYL-O-HYDROCARBYLPHOSPHOROAMIDOTHIOATE METAL SALTS

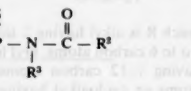
**Hans G. Franke, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Continuation-in-part of Ser. No. 317,479, Dec. 21, 1972, Pat. No. 3,832,425. This application June 17, 1974, Ser. No. 479,970**

**Int. Cl.² C07F 9/24**

**U.S. Cl. 260—987** **9 Claims**

1. A process for preparing S-metal salts of N-acylphosphoroamidothioates which comprises reacting an N-acylphosphoroamidothioate of the formula



wherein $R^1$ individually is alkyl, alkenyl, or alkynyl of up to 6 carbon atoms, $R^2$ has up to 18 carbon atoms and is hydrogen, alkyl, alkenyl, phenyl, aralkyl or alkaryl substituted with up to 3 fluorine, chlorine or bromine atoms or with up to 1 alkoxy or alkylthio of 1 to 4 carbon atoms, and $R^3$ is hydrogen or alkyl of 1 to 6 carbon atoms, with an alkali or alkaline earth metal sulfide or polysulfide and from 0.2 mol to 5 mols of sulfur per mol of sulfide or polysulfide, in liquid phase at a temperature of about 10°C to 125°C.

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**3,896,194**

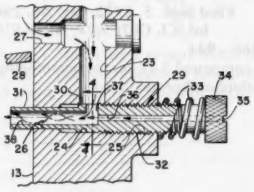
## CARBURETOR IDLE CONTROL MEANS

**Frank T. Martin, 925 Majorca Ave., Coral Gables, Fla. 33134**

**Filed June 6, 1974, Ser. No. 477,317**

**Int. Cl. F02m 3/08**

**U.S. Cl. 261—41 D** **7 Claims**




1. In a carburetor having a side wall defining an air horn and a throttle bore in communication with the air horn, a throttle valve in the throttle bore for controlling flow of air and fuel therethrough, said side wall having a radial bore therethrough spaced below the throttle valve and including an inner end portion defining an idle fuel discharge port opening into the throttle bore, an idle fuel supply passage means in communication at one end with a fuel supply and in communication at the other end with the radial bore, the improvement comprising an elongage idle mixture control screw extended completely through the radial bore in the side wall of the carburetor and having a screw threaded outer end portion threadably engaged in said radial bore and extending outside the carburetor and having a smooth, cylindrical inner end portion sealingly and slidably engaged in and extended through the idle fuel discharge port and into the throttle bore of the carburetor and precluding flow of fuel through said discharge port around said screw, said screw having an axial passage therethrough opening through the opposite ends thereof and a radial passage communicating at its inner end with the axial passage and at its outer end with the idle fuel supply passage means, so that air is drawn from atmosphere into the axial passage and fuel is drawn through the radial passage into the axial passage and is mixed with air therein, said air-fuel mixture discharged

through said inner end of the screw into the throttle bore of the carburetor spaced from the side wall thereof for thorough mixing and atomization of the fuel and air and thus resulting in more efficient operation and reduced fuel consumption and less air pollution.

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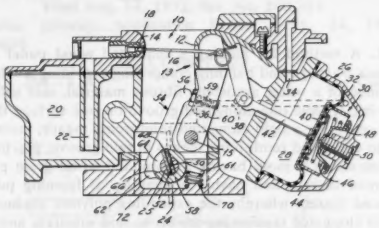
**3,896,195**

## ACCELERATION RESPONSIVE SUPPLEMENTAL FUEL SUPPLY FOR VARIABLE AREA VENTURI CARBURETOR

**Robert S. Harrison, Grosee Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 26, 1973, Ser. No. 428,525**
**Int. Cl. F02m 9/06**
**U.S. Cl. 261—44 R** **1 Claim**



1. A carburetor variable venturi control device for use with a carburetor having an induction passage open to air essentially at atmospheric pressure at one end and adapted to be connected to an internal combustion engine intake manifold at the opposite end, the induction passage containing a movable variable area venturi, defined by at least one movable partial venturi-shaped wall cooperating with a number of matingly venturi-shaped stationary walls together defining a venturi, the movable wall being movable to vary the cross-sectional area of the venturi, a variable area fuel port adjacent the venturi whereby fuel is inducted into the passage during airflow through the venturi, tapered fuel metering means secured to the movable wall and cooperating with the fuel port to vary the fuel port area as a function of the change in venturi area to change fuel flow concurrent with airflow capacity changes, a throttle valve mounted for a rotative movement across the passage between closed and fully open positions to control airflow capacity through the passage, control means to simultaneously vary the area of the venturi and the fuel port to vary both airflow and fuel flow, including vacuum servo means operably connected to the venturi movable wall to move the same and responsive to rises in carburetor venturi-like vacuum acting thereon for enlarging the venturi and fuel port, and other means operable in response to a predetermined movement of the throttle valve to increase fuel flow by overriding the action of the venturi-like vacuum servo means and mechanically moving the venturi movable wall to a larger venturi area position than the position to which the venturi movable wall normally would be moved by the level of venturi-like vacuum acting on the servo means, to increase fuel flow and airflow capacity beyond the level that would be provided by movement of the wall by the level of venturi-like vacuum prevalent for the same position of the throttle valve and engine speed and load conditions, the other means comprising a lever rotatably mounted on the throttle valve with a lost motion connection therebetween, the lever being operably engagable with the venturi wall to move the same after a predetermined initial opening movement of the throttle valve, the lost motion connection including a shaft mounting the throttle valve, pin means projecting from the shaft, the lever having an abutment portion in the path of opening throttle valve movement of the pin means to be engaged by the second means, the portion being spaced from the pin means in the closed position of the throttle valve, and spring means biasing the lever abutment portion towards the pin means away from the venturi movable portion.

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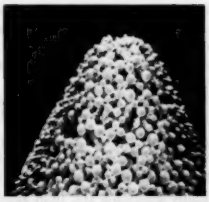
**3,896,196**

## METHOD OF PRODUCING SPHERICAL THERMOPLASTIC PARTICLES

**Clarence A. Dickey, Atlanta, and John E. McDaniel, Fairburn, both of Ga., assignors to Glasrock Products, Inc., Atlanta, Ga.**

**Filed Feb. 27, 1973, Ser. No. 336,179**
**Int. Cl. B29d 27/00**
**U.S. Cl. 264—6** **7 Claims**



1. A process for the manufacture of a porous thermoplastic product comprising:

a. mixing thermoplastic polymer particles in a liquid medium at a first temperature to form a stable suspension;
b. breaking said suspension into droplets;
c. passing said droplets through a heating zone wherein said droplets are heated to a second temperature sufficient to at least partially solubilize said thermoplastic and to evaporate said liquid medium from said droplets, said droplets being converted into spheres by surface tension, and wherein said spheres are subsequently solidified;
d. collecting said solidified spheres; and
e. molding said collected solid spheres at a temperature sufficient to sinter said spheres thereby forming said spheres into a unitary porous structure, said porous structure being defined by the interstices between said sintered spheres.

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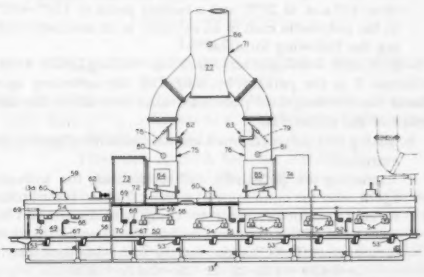
**3,896,197**

## METHOD OF MAKING SYNTHETIC RESIN SURFACE COVERING INCLUDING USE OF TWO HEAT TRANSFER MODES

**John Francis Gillespie, Corona del Mar, Calif., assignor to Saguaro Industries, Inc., Kingman, Ariz.**

**Filed Sept. 1, 1972, Ser. No. 285,844**
**Int. Cl. B29d 7/00**
**U.S. Cl. 264—40** **6 Claims**



1. In a method for manufacturing fabricless vinyl resin carpeting and the like, the steps comprising:

a. disposing a predetermined quantity of a fusible synthetic resin on a moving carrier and moving said carrier with said resin thereon through a series of heating zones, each

of said zones being individually controlled to successively increase the temperature of said resin from that in the preceeding zone;

b. progressively heating said quantity of fusible synthetic resin in each of said successive zones to ultimately raise it to the fusion temperature and cause said quantity of fusible synthetic resin to fuse prior to discharge from the last of said series of heating zones;

c. individually sensing and controlling at least two temperatures in each of said successive zones so as to effect complete fusion of said resin without excessive heating thereof by:

1. predetermining the temperatures to be attained at, at least, two points in each of said successive zones to successively increase the temperature of the resin to the desired fusion temperature for said resin prior to discharge from the last of said series of heating zones, one of said temperatures being measured adjacent said resin and another temperature being that of the atmosphere in said zone measured at a point remote from said resin;

2. sensing deviations in the temperature at each of said points of each of said zones as compared to said predetermined temperature for that point of that zone;

3. automatically adjusting the heat supplied in a zone to compensate for the deviation sensed in the temperature at a point to adjust the temperature to the predetermined temperature for that point; and

d. embossing said quantity of fusible synthetic resin after fusing to provide at least one external surface thereof with a design pattern.

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**3,896,198**

## PROCESS FOR PRODUCING A FOAMED POLYOLEFIN INSULATED CONDUCTOR

**Atushi Utumi; Yasuaki Fujiwara; Akira Asai, all of Hyogo, and Masao Jitsukawa, Saitama, all of Japan, assignors to Dainichi Nippon Cable Co., Ltd., Amagasaki, Japan**

**Filed Jan. 31, 1973, Ser. No. 328,162**

**Claims priority, application Japan, Jan. 31, 1972, 47-11731**

**Int. Cl. B29d** *27/00;* **B29f** *3/10*

**U.S. Cl. 264—45.9** **13 Claims**

1. A process for producing a foamed polyolefin insulated conductor having a insulation wall thickness of 0.08–0.5 mm by extruding an expandable polyolefin melt, wherein the polyolefin has a melt index of 0.1 to 2.0 10 g/min, containing a chemical blowing agent onto a conductor having an outer diameter of 0.32–1.20 mm comprising:

a. adding an organic softening agent having a viscosity lower than $10^4$ c.st. at 20°C and a boiling point of 150°–400°C to the polyolefin melt in an extruder in an amount satisfying the following formula:

$$5 \leqq X, \text{ and } -10\log_{10}(MI) \leqq X \leqq -10\log_{10}(MI) + 30$$

wherein $X$ is the percent by weight of the softening agent based on the weight of polyolefin melt and $MI$ is the melt index of the polyolefin;

b. mixing said polyolefin melt and said softening agent in the extruder;

c. extruding the polyolefin melt containing the softening agent onto the conductor to make a foamed layer around it, said conductor, prior to being introduced into the crosshead of the extruder, having been heated up to the temperature Tc(°C) satisfying the following formula:

$$-0.4Tr + 160 \leqq Tc \leqq -0.4Tr + 300$$

wherein $Tr$ is the temperature of the polyolefin melt in the crosshead of the extruder; and then

d. initiating the water cooling of the foamed polyolefin layer on the conductor within $2 \times 10^{-2}$ seconds after the layer leaves the crosshead of the extruder.

**3,896,199**

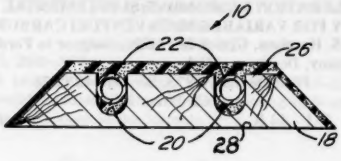
## METHOD FOR MAKING SIMULATED WOOD PANEL

**David E. Michaelis, Warminster, Pa., assignor to Plastics Development Corporation of America, Philadelphia, Pa.**

**Filed Sept. 21, 1972, Ser. No. 291,100**

**Int. Cl. B29d** *27/04, 29/02*

**U.S. Cl. 264—46.5** **7 Claims**




1. A method for making a simulated wood panel which resists warpage and bending comprising providing a substrate formed of a water absorbing fibrous material, said substrate having at least one elongated groove on one surface thereof for receiving a rigid elongated reinforcing means, inserting a rigid elongated reinforcing means in said groove, placing said substrate in a mold having a simulated wood grain pattern formed therein and having a quantity of foaming polymer placed therein whereby the expanding polymer anchors said rigid elongated reinforcing means to said substrate and while foaming to a predetermined volume embeds said elongated reinforcing means into said foam and seals said substrate against moisture, while providing the outside surface of said foam polymer with a simulated wood grain finish.

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**3,896,200**

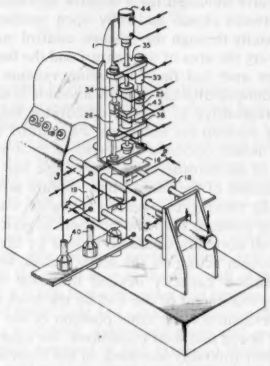
## METHOD OF MOLDING BIAXIALLY ORIENTED HOLLOW ARTICLES

**Fred E. Wiley, Longmeadow, Mass., and Edward W. Turner, Somers, Conn., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Continuation of Ser. No. 706,219, Feb. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 489,934, Sept. 24, 1965, Pat. No. 3,390,426. This application June 11, 1970, Ser. No. 48,846**

**Int. Cl. B29c** *17/07*

**U.S. Cl. 264—89** **1 Claim**



1. A method for blow molding a biaxially oriented hollow article comprising: grasping a first end of a preformed hollow parison which has been heated in the solid state to a temperature between 1° and 50° F. below the crystalline melt temperature of the material comprising said parison; applying pressure radially inward from a plurality of directions toward a central point on a second end of said parison so as to effect a seal

without severing said parison at said second end; applying pressure against said thus sealed area from inside said parison; thereafter severing said parison by further application of said inwardly directed pressure; applying axial tension to said parison to stretch said parison; closing a mold cavity around said parison; and creating a pressure differential between the inner portion and outer portion of said parison so that said parison will expand to fill said mold.

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**3,896,201**

## METHOD OF PROCESSING RAW MATERIALS FOR THE MANUFACTURE OF GLASS

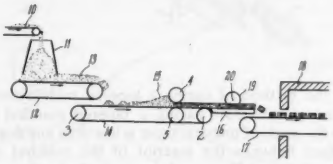
**Marcel Mabru, Paris, France, assignor to Saint-Gobain Industries, France**

**Filed Aug. 14, 1972, Ser. No. 280,324**

**Claims priority, application France, Aug. 24, 1971, 71.30696**

**Int. Cl. B01j** *2/22*

**U.S. Cl. 264—118** **7 Claims**



1. A method of processing vitrifiable powdery raw materials for the manufacture of glass by fusion which comprises:

a. mixing and moistening with water the raw materials,

b. depositing and supporting the mixed and moistened raw materials on a moving support,

c. pressing the mixed and moistened raw materials while on said support into a ribbon of approximately uniform thickness to a degree that the ribbon will break under its own weight when unsupported,

d. transporting the ribbon off of said support to an unsupported condition to cause the ribbon to break into fragments under its own weight, and

e. drying the resultant fragments for subsequent use in a fusion furnace for the manufacture of glass.

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**3,896,202**

## MANUFACTURE OF PROTECTIVE FOOTWEAR

**Alfred Palau, 64503 Pontacq, France**

**Filed May 7, 1973, Ser. No. 357,541**

**Claims priority, application France, Feb. 12, 1973, 73.004816**

**Int. Cl.[2] B29H** *7/08*

**U.S. Cl. 264—154** **7 Claims**

1. A method of manufacturing a protective sock, the sock including a sectional element of arcuate cross-section which defines an integral tongue, the method including the steps of: installing a sock-like inner liner comprised of a fabric material on a form whereby the inner liner corresponds exactly to the shape of the form;

placing the liner covered form in a mold;

injecting plastic material into the mold around the form and liner;

preventing flow of the injected plastic material into at least a pair of spatially displaced elongated arcuate regions extending from the upper edge of the desired sock to the area of the instep;

permitting the injected material to cure so as to define a molded one piece sock; and

cutting the upper leg portion of the molded sock to the instep along lines defined by the regions from which the injected plastic material has been excluded to define an integral tongue.

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**3,896,203**

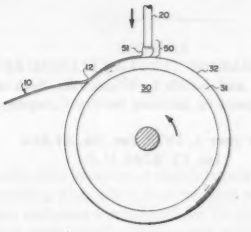
## CENTRIFUGAL METHOD OF FORMING FILAMENTS FROM AN UNCONFINED SOURCE OF MOLTEN MATERIAL

**Robert E. Maringer, Worthington, and Carroll E. Mobley, Jr., Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio**

**Filed Apr. 23, 1973, Ser. No. 353,692**

**Int. Cl. B29c** *5/04*; **B22d** *11/06*

**U.S. Cl. 264—165** **13 Claims**



1. A method of making filamentary material comprising the steps of:

a. heating a solid material so as to form an adherent pendant drop;

b. rotating a heat-extracting member at a rate so as to yield a velocity on its circumferential edge in excess of 3 feet per second;

c. limiting the area on said edge by constructing said member with at least one circumferential projection; and

d. contacting the surface of said pendant drop of molten material with said edge.

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**3,896,204**

## MELT-EXTRUSION OF ACRYLONITRILE POLYMERS INTO FILAMENTS

**Albert Goodman, Martinsville, and Mark A. Suwyn, Waynesboro, both of Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

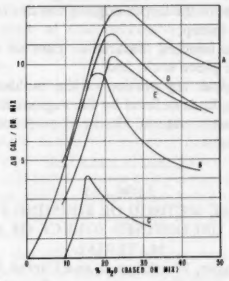
**Filed Oct. 2, 1972, Ser. No. 294,186**

**Int. Cl.[2] D01F** *7/00*; **D01D** *5/04*

**U.S. Cl. 264—206** **10 Claims**

1. In the process for preparing acrylonitrile polymer filaments, the improvement for providing better loop tenacities which comprises mixing and heating to form a substantially single phase composition of (a) one or more acrylonitrile polymers which contain at least 40 weight percent acrylonitrile units, (b) about 0.5 to about 10 parts by weight of a compatible solvent per 100 parts by weight of polymer, and (c) an amount of water which is between 45 and 100 percent by weight of the minimum amount required to hydrate all of the nitrile groups present in the polymer, with the proviso that

there is sufficient water to hydrate at least 80 percent of any coupled nitrile groups present; extruding the substantially single phase composition under at least autogenous pressure



to form filaments at a temperature between about 25°C. below and about 10°C. above the temperature of hydrate formation of the polymer; and then processing the filaments in conventional manner.

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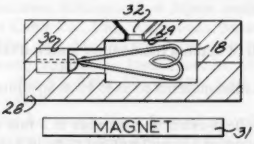
**3,896,205**

## METHOD FOR MAKING TUBULAR FLUIDIC RESISTORS

**David C. Broker, and Judith L. Wisniewski, both of Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.**

**Filed June 1, 1970, Ser. No. 41,814**
**Int. Cl. B28d** *3/00*
**U.S. Cl. 264—251** **4 Claims**



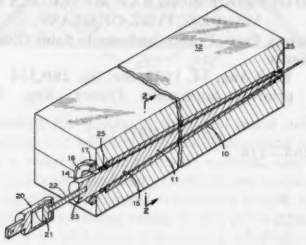

**1.** A method of forming a linear fluidic capillary member defining a capillary passageway having a predetermined and accurate length and diameter for insertion of an accurate linear flow resistance in a fluidic circuit, comprising forming of a cavity mold having a cavity wall with a pair of spaced locations corresponding to the opposite ends of the capillary passageway, forming a rod member as a rectilinear member having a length in excess of the length of said capillary passageway, releasably attaching bead members spaced in accordance with the length of said capillary passageways, inserting said rod member with said beam members within the mold cavity with the rod shaped in accordance with said capillary passageway, and with the rod member engaging the cavity wall at said pair of spaced locations in accordance with the opposite ends of the capillary passageway, filling the mold cavity with a molding material to enclose the rod member except at said cavity walls, said rod member and said molding material being selected of non-adhering mediums and said rod member having a rigid and smooth outer peripheral surface, pulling one end of said rod member and thereby removing said rod member to directly define a capillary passageway, and removing said bead members from the molded member to expose the ends of said passageways.

**3,896,206**

## METHOD FOR FORMING AND CURING A FIBER REINFORCED HOLLOW EPOXY SHAFT

**Guy Daniel Beaver, Wadsworth; Robert Cleland Young, Louisville, and Donald Theodore Martin, Alliance, all of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.**

**Filed June 25, 1973, Ser. No. 373,206**
**Int. Cl. B29d** *9/04;* **B29g** *1/00*
**U.S. Cl. 264—258** **6 Claims**



**1.** In the method of curing a tapered multilayered fiber reinforced plastic shaft having a tapered mandrel therein wherein the angle of mandrel taper is less than one degree, the intersurface between the exterior of the mandrel and the innermost layer of fiber reinforced plastic having a film of lubricant therebetween, the innermost layer of fiber reinforced plastic having the fibers therein extended beyond the other layers at the end of the shaft adjacent the larger end of the mandrel, the improved method comprising placing the shaft and mandrel in a mold, fixing the extended ends of the fibers of the innermost layer to the mold, heating the mold and the shaft therein to a selected temperature, forcing the tapered mandrel longitudinally into the shaft to exert an outward pressure on the shaft, controlling the longitudinal movement of the mandrel to determine the radial pressure exerted on the shaft, removing the mandrel and shaft from the mold, and removing the mandrel from the shaft.

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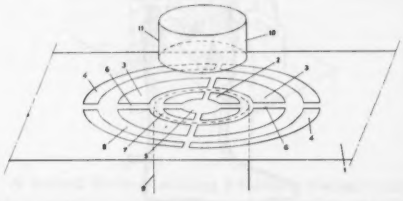
**3,896,207**

## PROCESS FOR FORMING HOLLOW BODIES OF THERMOPLASTIC MATERIAL

**Jean Cospen, Cachan, and Bernard Baumann, Paris, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France**

**Filed Dec. 13, 1973, Ser. No. 426,708**
**Claims priority, application Luxemburg, Dec. 13, 1972, 66646**
**Int. Cl. B29b** *3/00;* **B29d** *23/13*
**U.S. Cl. 264—322** **4 Claims**



**1.** A process for stamping blanks of thermoplastic material for the formation of hollow bodies of cylindrical shape in which, prior to the stamping stage, the blanks are heated to the pre-fusion point of the thermoplastic material in zones in the form of ring segments which are transformed into quadri-

laterals upon stamping, with the portion between said ring segments below the pre-fusion point of the thermoplastic material.

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**3,896,208**

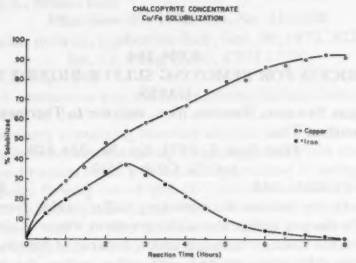
## HCL TREATMENT OF COPPER SULFIDE MINERALS

**Michael Dubeck, Birmingham, Mich., and Leon Lech, Windsor, Canada, assignors to Ethyl Corporation, Richmond, Va.**

**Continuation-in-part of Ser. No. 266,475, June 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 255,833, May 22, 1972, abandoned. This application Mar. 29, 1973, Ser. No. 345,847**

**Int. Cl. C22b** *15/08, 11/06*

**U.S. Cl. 423—27** **22 Claims**




1. A process for recovering copper from sulfide copper mineral concentrate which comprises

1. treating said concentrate with (a) an acid material selected from the group consisting of hydrochloric acid, hydrogen chloride gas and mixtures thereof, and (b) an oxygen-bearing gas, said treatment being carried out, in an aqueous medium with said concentrate in slurry form, at about atmospheric pressure, at temperatures of from about 75°C. to about 105°C. to solubilize the copper from said concentrate,
2. separating insoluble material from the aqueous system obtained in step (1),

whereby (a) a solution is obtained containing copper as copper chloride, and (b) said insoluble material contains sulfur as free sulfur.

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**3,896,209**

## REDUCTION OF HEXAVALENT CHROMIUM

**Louis Byron Fournier, and Raymond Alan Meyer, both of Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.**

**Filed Jan. 22, 1973, Ser. No. 325,623**

**Int. Cl. C01g** *37/02, 37/00*

**U.S. Cl. 423—55** **9 Claims**

1. A method for treating an aqueous industrial waste solution containing hexavalent chromium ions to reduce the hexavalent chromium ions to trivalent chromium ions comprising the steps of

a. adjusting and maintaning the pH of the ion solution to a level below 1.5 by the addition as necessary of mineral acid; and
b. slowly adding hydrogen peroxide to the thusly acidified ion solution with continuing agitation to avoid local excesses of the peroxide and to promote an excess of chromate until addition of the peroxide is substantially complete, the amount of hydrogen peroxide added being at least equal to the stoichiometric amount necessary to reduce all of the hexavalent chromium in the ion solution to trivalent chromium.

**3,896,210**

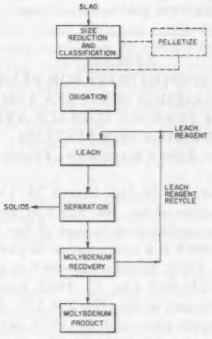
## METHOD FOR RECOVERING MOLYBDENUM FROM PARTICULATE SILICATE SLAGS

**Paul R. Ammann, Boxford, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 316,570, Dec. 19, 1972, abandoned, which is a continuation of Ser. No. 78,777, Oct. 7, 1970, abandoned. This application June 25, 1973, Ser. No. 372,983**

**Int. Cl. C01g** *39/00*

**U.S. Cl. 423—56** **17 Claims**




1. A method for recovering molybdenum from ferrosilicate slags containing iron, silica, molybdenum and other non-ferrous metals including a member from the group consisting of: the alkaline earth metals, calcium and magnesium; the alkali metal, sodium; and, mixtures thereof, comprising the steps of:

a. comminuting the slag to produce particulate slag;
b. oxidizing the particulate slag at a temperature between the range of 800°C and 1200°C to convert the particulate ferrosilicate slag into particles containing an iron oxide phase and a silicate phase, the oxidation step also oxidizing the molybdenum in the slag to its highest oxidation state so that molybdenum complexes with the alkali and alkaline earth metals in the slag to form stable molybdates that remain with the silicate phase;
c. selectively leaching the molybdenum from the oxidized slag of step (b) to form a molybdenum bearing leach solution; and

recovering molybdenum from the leach solution of step (c).

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**3,896,211**

## PURIFICATION OF IRON OXIDES

**Yoland Pierre Paul Mayor, and Pierre Francois Tord, both of Paris, France, assignors to Harle & Lechopiez, Paris, France**

**Continuation of Ser. No. 763,785, Sept. 30, 1968, abandoned. This application Feb. 5, 1973, Ser. No. 329,460**

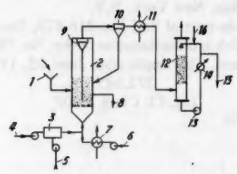
**Claims priority, application France, Oct. 2, 1967, 67.123049; Jan. 3, 1968, 68.134647**

**Int. Cl. C01g** *49/02;* **C21b** *1/04;* **C22b** *11/06*

**U.S. Cl. 423—138** **6 Claims**

1. A method for the purification of iron oxides containing non-ferrous metals impurities consisting essentially of intimately contacting said oxides in a reaction zone at a temperature of about 550° – 700°C with a vapor mixture of a halohydric gas in the presence of 0.5 to 10 parts by weight of steam per each part by weight of halohydric gas, whereby halides of non-ferrous metal impurities are formed and vaporized, leav-

ing iron oxide as a solid phase, carrying off said vaporized halides out of said reaction zone by means of a current of a hot



carrier gas flowing through said reaction zone, and recovering purified iron oxodes from said reaction zone.

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**3,896,212**

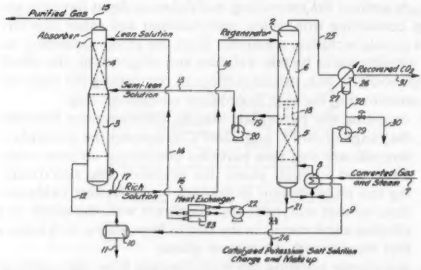
**METHOD AND COMPOSITIONS FOR REMOVING ACID GASES FROM GASEOUS MIXTURES AND REDUCING CORROSION OF FERROUS SURFACE AREAS IN GAS PURIFICATION SYSTEMS**

**Allen G. Eickmeyer, 7204 Cherokee Dr., Prairie Village, Kans. 66208**

**Continuation of Ser. No. 22,505, March 25, 1970, which is a continuation-in-part of Ser. No. 523,926, Feb. 1, 1966, abandoned, and a continuation-in-part of Ser. No. 432,334, Feb. 12, 1965, which is a continuation-in-part of Ser. No. 291,532, June 28, 1963, abandoned, which is a continuation-n-part of Ser. No. 231,963, Oct. 22, 1962, abandoned, which is a continuation-in-part of Ser. No. 209,221, July 11, 1962, abandoned. This application Sept. 17, 1973, Ser. No. 398,066**

**Int. Cl. B01d** *53/34*

**U.S. Cl. 423—223** **9 Claims**




1. In an absorption-desorption process for removing carbon dioxide from a gaseous mixture containing substantially no oxygen or hydrogen sulfide, wherein said mixture is contacted with an aqueous absorption solution comprising at least one potassium salt selected from the group consisting of potassium carbonate, potassium borate and mixtures thereof, said solution thereafter being regenerated by removing at least a portion of the absorbed carbon dioxide and thence recycled for further absorptive contact with said gaseous mixture, the improvement which comprises:

adding a small amount of a corrosion inhibitor selected from the group consisting of the sodium, potassium and ammonium metavandates and peroxyvanadates to said aqueous absorption solution; and

contacting said absorption solution with a small amount of an oxidizing agent selected from the group consisting of air, oxygen, hydrogen peroxide and the alkali metals dichromates,

said oxidizing agent being present in an amount sufficient to maintain most of said corrosion inhibitor in an oxidized condition.

**3,896,213**

**PROCESS FOR DISPOSING OF OFF-GASES CONTAINING CARBON DIOXIDE AND CHLORINE**

**Louis C. Hirdler, Lake Charles, La., assignor to Olin Corporation, New Haven, Conn.**

**Filed July 5, 1973, Ser. No. 376,491**

**Int. Cl. B01d** *53/34;* **C01b** ; **C07d** *55/36*

**U.S. Cl. 423—232** **20 Claims**

1. The process for disposing of off-gases comprised of a gaseous mixture of carbon dioxide and chlorine which comprises reacting said gaseous mixture containing from about 0.1 to about 50 percent by volume of chlorine with an aqueous solution of an alkaline compound selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, alkaline earth metal hydroxides and alkaline earth metal carbonates in the presence of a reducing agent to form a substantially neutral aqueous solution containing an alkaline bicarbonate and an alkaline chloride.

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**3,896,214**

**PROCESS FOR REMOVING SULFUR DIOXIDE FROM GASES**

**Jacques Newman, Houston, Tex., assignor to Thermotics, Inc., Houston, Tex.**

**Filed Sept. 5, 1972, Ser. No. 286,449**

**Int. Cl. C01b** *17/00*

**U.S. Cl. 423—242** **8 Claims**

1. In the process for removing sulfur oxides from gas in which the gas enters a scrubbing system where it contacts a hydroxide solution having a cation capable of forming water-soluble salts when reacted with sulfur oxides, the improvement which comprises

regenerating the hydroxide solution by contacting a solution of the water-soluble salt with an anion exchange resin in the free hydroxyl form whereby hydroxyl radicals of the resin are replaced by the anion of the salt and react with the cation of the salt, thereby at least partially exhausting the resin of hydroxyl ions,

returning the regenerated hydroxide solution to the scrubbing system, and regenerating the exhausted resin by contacting it with a solution of a hydroxide having a cation which forms a salt substantially insoluble in water when reacted with the anion on the exhausted resin, whereby the hydroxyl radicals of the latter hydroxide replace the anions on the resin and the cations of the latter hydroxide react with said anions to form water-insoluble salts.

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**3,896,215**

**PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE FROM A GAS STREAM**

**Kœrl Bratzler, Bad Homburg; Alexander Doerges, and Johann Schlauer, both of Frankfurt am Main-Goldstein, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Oct. 19, 1973, Ser. No. 407,997**

**Claims priority, application Germany, Nov. 3, 1972, 2253806**

**Int. Cl. C01b** *17/04*

**U.S. Cl. 423—573** **11 Claims**

1. A method of removing hydrogen sulfide from a gas stream, comprising the steps of:

a. passing said gas stream through a Claus-process reactor having at least one stage and reacting the hydrogen sulfide with oxygen therein to produce elementary sulfur and an effluent gas stream containing residual sulfur at least part of which is in the form of hydrogen sulfides;

b. afterburning said effluent gas stream and contacting same at a temperature of 200° to 500°C with a layer of coke to form sulfur dioxide and minimize sulfur trioxide formation

c. cooling the gas stream contacted with said layer to a temperature of at most 50°C;
d. scrubbing the cold gas with an absorbent solution capable of reversibly binding sulfur dioxide from which in the afterburning of said effluent gas stream;
e. desorbing sulfur dioxide from the absorbent solution by the application of heat thereto; and
f. feeding the desorbed sulfur dioxide to step (a) for admixture with the gas stream fed through said Claus-process reactor to augment the sulfur dioxide concentration thereof.

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3,896,216

## PROCESS FOR THE PREPARATION OF BARIUM TITANATE

**Giuliano Fagherazzi; Francesco Ferrero, and Gianfranco Accattino, all of Novara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy**

**Filed Nov. 27, 1973, Ser. No. 419,250**
**Claims priority, application Italy, Nov. 30, 1972, 32283/72**
**Int. Cl. C01g** *23/00; C01f 11/00*
**U.S. Cl. 423—598** **2 Claims**

1. A continuous process for preparing barium titanate characterized in that:
a. a slurry containing titanium dioxide and a barium source selected from the group consisting of barium carbonate and barium oxide is dried and granulated by using the hot gases flowing out of step (b), supplemented by hot gases obtained separately, and which have inlet temperatures of from 400° to 800°C, thus obtaining granules with an average size of 150–300 microns;
b. the granules obtained in step (a) are calcined at temperatures between 1150° and 1200°C in a fluid bed reactor, for 0.5–4 hours, by injecting into the reactor itself an oxidizing or inert gas heated either inside or outside the reactor itself; and
c. the product thus obtained is cooled down in a controlled manner and is then ground to obtain the desired final product.

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3,896,217

## METHOD AND APPARATUS FOR RADIOIMMUNOASSAY WITH REGENERATION OF IMMUNOADSORBENT

**Lavell R. Johnson, Salt Lake City, Utah, assignor to Summa Corporation, Las Vegas, Nev.**

**Filed Mar. 19, 1973, Ser. No. 342,513**
**Int. Cl. A61k** *27/04;* **G01n** *23/00*
**U.S. Cl. 424—1** **10 Claims**

1. In an analytical method for biochemical analysis of an antigen wherein a mass of antibodies specific to a selected antigen is immobilized to form an immunoadsorbent and wherein a solution containing the selected antigen is flowed into and out of contact with the immunoadsorbent whereby at least part of said selected antigen is bound to said mass of antibodies immobilized by said immunoadsorbent and the remainder is not bound to said antibodies, the improvement which comprises the steps of:
regenerating the immunoadsorbent for reuse by releasing the antigen bound to the antibodies of the immunoadsorbent,
said regenerating step including contacting said immunoadsorbent with a solvent characterized by the ability to break the bond between the antigen bound to the antibody of the immunoadsorbent to free substantially all of said antigen therefrom without substantially adversely affecting the flow-through quality of said immunoadsorbent and the capacity thereof to bind antigen material subsequently brought into contact therewith,
utilizing at least one of (1) the said remainder which is not bound to said aantibodies or (2) the antigen formerly bound to said immunoadsorbent and released during regeneration thereof, or both, in an analytical assay of said selected antigen, and
repetitively reusing said regenerated immunoadsorbent for analytical assays of further selected antigen material.

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3,896,218

## RADIOMMUNOASSAY DETERMINING THE HEPATITIS ASSOCIATED ANTIGEN CONTENT OF BLOOD

**Stanley E. Charm, Newton, and Bing Lou Wong, Somerville, both of Mass., assignors to Research Corporation, New York, N.Y.**

**Filed July 13, 1972, Ser. No. 271,452**
**Int. Cl. A61k** *27/04*
**U.S. Cl. 424—1** **4 Claims**

1. A method of determining the HAA content of a fluid comprising an unknown quantity of HAA particles per unit value designated *H*, comprising the steps of:
I. Coupling serum hepatitis antibody to a support phase comprising carbohydrate groups by the sequential steps of treating said support phase with cyanogen bromide, raising the pH of the mixture to between pH 10 and pH 12, removing the supernatant liquid, washing said support phase at from about ph 7 to about pH 8, adding said serum hepatitis antibody to the mixture, washing the mixture free of unreacted antibody, buffering the support phase/antibody complex to pH 7.8 to pH 8 to yield a complex designated BHAB,
II. Incubating a predetermined portion of the thus produced support phase/antibody complex with the fluid containing HAA,
III. Washing the thus produced support phase/antibody/-HAA complex designated BHAB/HAA,
IV. Incubating said BHAB/HAA with radio active HAA,
V. Washing the thus produced BHAB/HAA/radio active HAA complex,
VI. Measuring the radio activity of said BHAB/ HAA/radio active HAA complex to obtain a value designated *B* units of radio activity,
VII. Incubating a predetermined portion of the support phase of Step (I) designated as BHAB using the same quantity thereof as utilized in Step (II) under the same physical conditions of incubation using neutral saline as the incubation medium,
VIII. Washing the product of Step (VII),
IX. Incubating the product of Step (VIII) with radio active HAA selected from the sample used in Step (IV) for the same time under the same conditions of temperature, pressure and pH,
X. Washing the product of Step (IX),
XI. Measuring the radio activity of the product of Step (X) to obtain a value designated $B_o$ units of radio activity,
XII. Repeating Steps (II) – (VI) utilizing a fluid containing a predetermined quantity of HAA particles per unit value designated as $^aH$ to obtain a value designated $^aB$ units of radio activity.

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3,896,219

## S-CHLOROMETHYL DIETHYL PHOSPHOROTHIOLOTHIONATE AS A SOIL INSECTICIDE

**Max Pianka, St. Albans, England, assignor to The Murphy Chemical Company Limited, St. Albans, England**

**Continuation of Ser. No. 169,875, Aug. 6, 1971, abandoned, which is a continuation of Ser. No. 824,291, May 13, 1969, abandoned. This application Sept. 28, 1973, Ser. No. 401,692**
**Claims priority, application United Kingdom, May 25, 1968, 25279/68**
**Int. Cl. A01n** *9/36*
**U.S. Cl. 424—225** **1 Claim**

1. A method for the control of wireworms and the larvae of rootflies in soil by applying to the soil containing said pests or larvae from 1.12 to 4.49 kg/ha of s-chloromethyl diethylphosphorothiolothionate.

3,896,220

## METHOD OF TREATING FUNGAL INFECTIONS WITH AZIDO COMPOUNDS

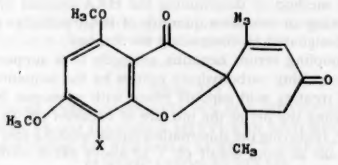
Elliot L. Shapiro, and Ashit K. Ganguly, both of Cedar Grove, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 269,347, July 6, 1972, Pat. No. 3,816,472. This application Apr. 18, 1974, Ser. No. 462,055

Int. Cl. A61k *27/00*

U.S. Cl. 424—226 3 Claims

1. A method for treating fungal infections comprising administering to a mammal infected with a fungus, a fungistatically effective amount of a compound represented by the structural formula:



wherein X is hydrogen, bromine, chlorine or fluorine.

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3,896,221

## ANESTHETIC COMPOSITION

George Johnstone Christie, Skaneateles, and Frank Harold Buckwalter, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 28, 1973, Ser. No. 336,848

Int. Cl. A61k *27/00*

U.S. Cl. 424—246 9 Claims

1. A method for inducing anesthesia in an animal which comprises injecting said animal with an effective amount of an anesthetic composition comprising 100.0 mg. of ketamine hydrochloride, 7.5 mg. of promazine hydrochloride and 0.0625 mg. of aminopentamide hydrogen sulphate in an amount of water sufficient to make up 1 ml.

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3,896,222

## COMPOSITIONS CONTAINING A CARBONAMIDOQUINOXALINE-DI-N-OXIDE AND METHOD OF USING SAME

Florin Seng, Cologne; Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

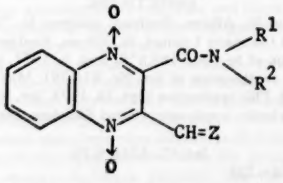
Division of Ser. No. 249,121, May 1, 1972. This application Sept. 20, 1973, Ser. No. 399,445

Claims priority, application Germany, May 7, 1971, 2122572

Int. Cl. A611 *27/00*

U.S. Cl. 424—248 83 Claims

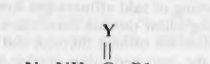
1. An antibacterial composition comprising an antibacterially effective amount of a compound of the formula:



wherein

each of $R^1$ and $R^2$, independent of the other, is hydrogen, lower alkyl, hydroxy(lower alkyl), (lower alkoxy)lower alkyl, cyclopentyl, cyclohexyl or cycloheptyl, or $R^1$ and $R^2$, together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino, hexamethyleneimino, morpholino or thiomorpholino; and

Z is =N—OH or



in which Y is an oxygen or sulfur atom and $R^3$ is lower alkyl, hydroxy(lower alkoxy), lower alkoxy, pyridyl, or $-NR^5R^6$ in which each of $R^5$ and $R^6$, independent of the other, is hydrogen, lower alkyl, hydroxy(lower alkyl) or lower alkoxy(lower alkyl), or $R^5$ and $R^6$, together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino, hexamethyleneimino, morpholino or thiomorpholino, in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

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3,896,223

## ANTI-INFLAMMATORY THIAZOLE COMPOSITIONS AND METHODS FOR USING SAME

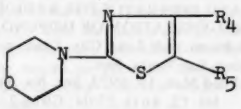
Zaven S. Ariyan, Woodbury, Conn., and William A. Kulka, Guelph, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Montreal, Canada

Division of Ser. No. 201,143, Nov. 22, 1971, Pat. No. 3,796,800. This application Oct. 12, 1973, Ser. No. 405,944

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—248 28 Claims

1. A method of preventing and inhibiting the formation of granuloma tissue in an animal subject, said method comprising administering to an animal subject a therapeutically effective amount of a compound having the formula as hereinafter set forth:



wherein $R_4$ is a lower alkyl, $R_5$ is hydrogen, $—CONHC_6H_5$, or $—CONHC_6H_3$(2,6-diethyl); or a pharmaceutically acceptable acid addition salt thereof.

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3,896,224

## 1-(4′,6′-DICHLORO-S-TRIAZIN-2-YLCARBAMOYL)-2-METHOXY- CARBONYLAMINO-BENZIMIDAZOLE AS PESTICIDE

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 347,739, April 4, 1973, Pat. No. 3,840,538. This application July 17, 1974, Ser. No. 489,314

Claims priority, application Switzerland, Apr. 10, 1972, 5209/72

Int. Cl.[2] A01N *9/00, 9/22*

U.S. Cl. 424—249 2 Claims

1. A pesticidal composition for controlling bacteria, fungi and nematodes comprising a pesticidally effective amount of 1-(4′, 6′-dichloro-s-triazin-2-ylcarbamoyl)-2-methoxy-carbonylaminobenzimidazole and a pesticide carrier.

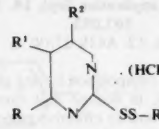
3,896,225

## HYDROCARBYL SULFENYLMERCAPTO PYRIMIDINES USED AS PESTICIDES

Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 201,185, Nov. 22, 1971, Pat. No. 3,821,222. This application Apr. 17, 1974, Ser. No. 461,578
Int. Cl.[2] A01N 9/00; A01n 9/22
U.S. Cl. 424—251 10 Claims

1. A method for controlling fungi which comprises applying to said fungi or its habitat a fungicidally effective amount of the compound of the formula



wherein $R^1$ is hydrogen, R and $R^2$ are individually hydrogen, hydroxy or alkyl of 1 to 4 carbon atoms, and $R^3$ is

wherein $R^4$ is hydrogen or alkyl of 1 to 4 carbon atoms and $R^5$ is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms or phenyl substituted with 0 to 2 halogen atoms of atomic number 9 to 35, and *n* is 0 or 1.

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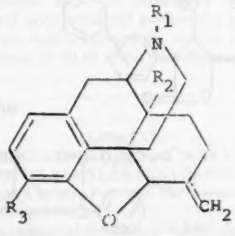
3,896,226

## 6-METHYLENE-6-DESOXY DIHYDRO MORPHINE AND CODEINE DERIVATIVES AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF, AND USE OF THE SAME AS A NARCOTIC ANTAGONIST

Jack Fishman, New York, N.Y., assignor to Evalina Lewinstein; Henry Hirsch and Stanley Rothschild, all of New York, N.Y.

Continuation-in-part of Ser. No. 202,575, Nov. 26, 1971, Pat. No. 3,814,768. This application Feb. 27, 1974, Ser. No. 446,498
Int. Cl. A61k 27/00
U.S. Cl. 424—260 19 Claims

1. A narcotic antagonist composition comprising
a. an effective amount of a compound selected from the group consisting of those having the formula



and pharmaceutically acceptable salts thereof
where $R_1$ is selected from the group consisting of allyl and cyclopropylmethyl, $R_2$ is selected from the group consisting of hydrogen and hydroxy, and $R_3$ is selected from the group consisting of hydroxy and methoxy, and
b. a pharmaceutically acceptable inert carrier.

3,896,227

## 1-(3-HYDROXYSTYRYL PYRIDINIUM SALTS AND THEIR DERIVATIVES AS WHIPWORM CONTROL AGENTS

James W. McFarland, and Harold L. Howes, Jr., both of East Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 169,087, Aug. 4, 1971, abandoned. This application June 19, 1973, Ser. No. 371,370
Int. Cl. A61k 27/00
U.S. Cl. 424—263 4 Claims

1. A method for treating a whipworm infected mammal which comprises orally or parenterally administering to said whipworm infected mammal a whipworm burden reducing amount of a compound selected from the group consisting of trans-1-(3-hydroxystyryl)pyridinium bromide, trans-1-(3-methoxystyryl)pyridinium bromide and trans-1-(3-benzoyloxystyryl)pyridinium bromide.

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3,896,228

## METHOD FOR TREATING NEPHRISES

Brian Peter Richardson, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 341,509, March 15, 1973, Pat. No. 3,849,562. This application July 24, 1974, Ser. No. 491,342
Int. Cl.[2] A61k 27/00
U.S. Cl. 424—266 5 Claims

1. A method of treating nephrosis which comprises administering to an animal in need of such treatment a therapeutically effective amount for the treatment of nephrosis of a prolactin inhibitor selected from ergocornine or 9,10-dihydroergocornine.

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3,896,229

## SLIME CONTROL COMPOSITIONS AND THEIR USE

Bernard F. Shema, Glenside, and Robert H. Brink, Jr., Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 27, 1973, Ser. No. 391,724
Int. Cl.[2] A01N 9/12, 9/20, 9/24
U.S. Cl. 424—270 8 Claims

1. A composition for the control of the microorganism *Aerobacter aerogenes* in aqueous systems comprising a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one calcium chloride and 25% 2-methyl-4-isothiazolin-3-one calcium chloride with an octyl-phenoxy polyethoxy ethanol, said ethanol possessing an average molecular weight of about 536 and a Brookfield viscosity (12 rpm) of about 260 cps at 25° C, wherein the weight ratio of the chloride mixture of the ethanol ranges from about 95:5 to about 5:95 respectively.

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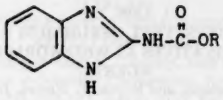
3,896,230

## FUNGICIDAL FORMULATIONS OF 2-BENZIMIDAZOLE-ARBAMIC ACID, ALKYL ESTERS

Hein L. Klopping, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Continuation of Ser. No. 182,541, Sept. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 862,081, Sept. 29, 1969, Pat. No. 3,657,443, which is a continuation-in-part of Ser. No. 727,036, May 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 629,914, April 11, 1967, abandoned. This application Feb. 1, 1974, Ser. No. 438,943The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.
Int. Cl. A01n 9/22
U.S. Cl. 424—273 8 Claims

1. A fungicidal composition useful for the systemic, curative and preventive treatment of fungus diseases in living plants with a wide margin of safety to the plants comprising a fungicidal amount of a compound represented by the formula:



where R is methyl or ethyl, with 10 to 50,000 parts per 100 parts of said compound of a nonphytotoxic spray oil selected from the group consisting of naphthenic spray oils having an unsulfonatable residue of from 75 to 100%, a viscosity in Saybolt seconds at 100°F. of 40 to 220 and a distillation at 10 mm/Hg. 50% point of 300° to 600°F., paraffinic spray oils having an unsulfonatable residue of from 75 to 100%, a viscosity in Saybolt seconds at 100°F. of 40 to 220 and a distillation at 10 mm/Hg. 50% point of from 300° to 600°F., natural triglyceride oils consisting essentially of glycerol esters of at least one fatty acid selected from the group consisting of caproic, caprylic, capric, lauric, myristic, palmitic, stearic, oleic, erucic, linoleic, linolenic, and eleostearic acid, and derived mono and diglycerides which are reaction products of glycerols with at least one fatty acid selected from the group consisting of caproic, caprylic, capric, lauric, myristic, palmitic, stearic, oleic, erucic, linoleic, linolenic and eleostearic acid.

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**3,896,231**

## 2,2-DIBROMO-3-NITRILOPROPIONAMIDE AND HEXACHLORODIMETHYLSULFONE AS A SLIME CONTROL COMPOSITION

**Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.**

**Filed June 28, 1973, Ser. No. 374,582**
**Int. Cl.[2] A01N** *9/06*
**U.S. Cl. 424—304** **8 Claims**

1. A composition for the control of Aerobacter aerogenes in aqueous systems comprising 2-2-dibromo-3-nitrilopropionamide and hexachlorodimethyl sulfone, wherein the weight ratio of the amide to the sulfone ranges from about 95:5 to about 5:95 respectively.

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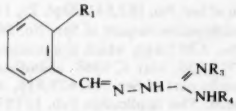
**3,896,232**

## SUBSTITUTED BENZYLIDENE HYDRAZINES AS ANTI-IGRAINE SYNDROME AGENTS

**William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.**

**Continuation-in-part of Ser. No. 322,623, Jan. 11, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 465,187**
**Int. Cl.[2] A61K** *27/00*
**U.S. Cl. 424—326** **10 Claims**

1. The method of treating the pain of the migraine syndrome, which comprises administering to a mammal in need of said treatment a migraine syndrome pain relieving effective amount of a compound of the formula



wherein

$R_1$ and $R_2$ are independently hydrogen, halo having an atomic weight of 19 to 36, methyl, or trifluoromethyl,

$R_3$ is hydrogen,

$R_4$ is hydrogen or OH, or

$R_3$ and $R_4$ together are $-(CH_2)_2-$,

provided that one of $R_1$ or $R_2$ is other than hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

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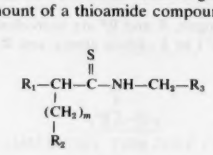
**3,896,233**

## PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING GASTRIC ACID SECRETION

**L. Martin Brenner, Havertown, and Bernard Loev, Broomall, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 266,024, June 26, 1972, Pat. No. 3,853,865. This application Sept. 18, 1974, Ser. No. 507,093**
**Int. Cl. A61k** *27/00*
**U.S. Cl. 424—248** **8 Claims**

1. A pharmaceutical composition having gastric acid secretion inhibitory activity, in dosage unit form, comprising a pharmaceutical carrier and an effective gastric acid secretion inhibiting amount of a thioamide compound of the formula:



in which:

*m* is 0 or 1;

$R_1$ is 2-pyridyl; and

$R_2$ and $R_3$ are di-lower alkylamino, N-lower alkyl-N-phenylamino, piperidino, pyrrolidino or morpholino

or a pharmaceutically acceptable acid addition salt thereof.

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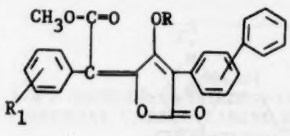
**3,896,234**

## PHARMACEUTICAL COMPOSITION AND METHOD EMPLOYING PHENYLVULPINIC ACID DERIVATIVES

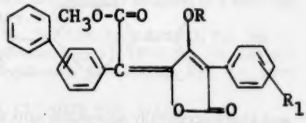
**Blaine M. Sutton, Hatboro, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.**

**Division of Ser. No. 279,597, Aug. 10, 1972, Pat. No. 3,780,065, which is a continuation-in-part of Ser. No. 188,555, Oct. 13, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 393,235**
**Int. Cl. A61k** *27/00*
**U.S. Cl. 424—279** **3 Claims**

1. A pharmaceutical composition having antiarthritic activity in dosage unit form comprising a pharmaceutical carrier and from about 10 mg. to about 50 mg. of a chemical compound selected from the formulas:



and



wherein:

R is hydrogen, acrylyl, methacrylyl, dimethylacrylyl, crotonyl or cinnamoyl; and

$R_1$ is hydrogen, chlorine, bromine, fluorine, lower alkyl of from 1 to 4 carbon atoms, lower alkoxy of from 1 to 4 carbon atoms, dimethoxy, trimethoxy, or trifluoromethyl.

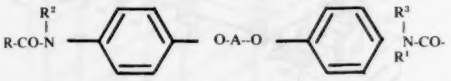
3,896,235

## ANTHELMINTIC ETHERS AND COMPOSITION THEREOF

Morton Harfenist, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

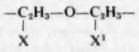
Filed Aug. 25, 1971, Ser. No. 174,986
Claims priority, application United Kingdom, Sept. 1, 1970, 41871/70; Sept. 1, 1970, 41872/70; July 23, 1971, 34668/71
Int. Cl. A01n 9/20, 1/24
U.S. Cl. 424—324 58 Claims

1. The method of treating a liver fluke infection in an infected mammal which comprises administering to said infected mammal a therapeutically effective liver fluke treatment amount of a compound of the formula



wherein R and $R^1$ are the same or different and each is selected from the class consisting of hydrogen,

saturated aliphatic hydrocarbon having 1 to 7 carbon atoms, and unsaturated aliphatic hydrocarbon having 2 to 4 carbon atoms; wherein $R^2$ and $R^3$ are the same or different and each is selected from the class consisting of hydrogen and lower alkyl having 1 to 4 carbon atoms; and wherein A is selected from the class consisting of $-CH_2-$, $-(CH_2)_2-$, $-CH_2-O-CH_2-$, and



wherein X and $X^1$ are the same or different and each is selected from the class consisting of hydrogen and alkyl having 1 to 3 carbon atoms.

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3,896,236

## SLIME CONTROL COMPOSITIONS AND THEIR USE

Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 271,459, July 13, 1972, Pat. No. 3,827,873, which is a continuation-in-part of Ser. No. 464, Jan. 2, 1970, abandoned. This application Apr. 9, 1973, Ser. No. 349,358
Int. Cl.[2] A01N 9/12, 9/20
U.S. Cl. 424—329 8 Claims

1. A composition of the control of the growth of the microorganism *Aerobacter aerogenes* in aqueous systems in which said microorganism is found comprising betabromo-beta-nitrostyrene and cetyl trimethyl ammonium p-toluene sulfonate, wherein the weight ratio of the styrene to the sulfonate ranges from about 10:90 to about 95:5 respectively.

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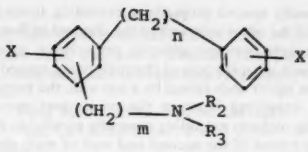
3,896,237

## METHOD OF TREATING CARDIAC ARRYTHMIA WITH PHENYLALKYLARALKYLAMINES

Marcia Elizabeth Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 106,889, Jan. 15, 1971, abandoned. This application Dec. 27, 1973, Ser. No. 428,643
Int. Cl.[2] A61K 27/00
U.S. Cl. 424—330 8 Claims

1. A method for treating cardiac arrhythmia in animals which comprises administering to an afflicted animal an antiarrhythmic dose of an active compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

X and X′ are selected from the group consisting of hydrogen, halogen, alkyl of from 1–6 carbon atoms, alkoxy of from 1–5 carbon atoms, perfluoroalkyl, alkylmercapto of from 1–6 carbon atoms, alkylsulfonyl of from 1–6 carbon atoms, and dialkylsulfamoyl of from 2–8 carbon atoms;

$R_2$ and $R_3$ are each members of the group consisting of hydrogen, alkyl of from 1–6 carbon atoms, aralkyl, alkenyl and alkynyl;

*m* is an integer selected from the group consisting of 1–4 inclusive; and

*n* is an integer selected from the group consisting of 1–3 inclusive.

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3,896,238

## DERMATOLOGICAL COMPOSITIONS

Donald Edward Smith, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 241,404, April 5, 1972, abandoned. This application Mar. 13, 1973, Ser. No. 340,787
Int. Cl. A61k 7/00, 27/10
U.S. Cl. 424—358 11 Claims

1. A composition in liquid or semi-liquid form adapted to topical application to animal tissue, comprising: (1) at least about 0.1% by weight of a sugar ester; and (2) at least about 0.1% by weight of a sulfoxide of the formula $R'S(O)R^2$ wherein R′ is a substituent selected from the group consisting of straight and branched chain alkyl, alkenyl, hydroxy-substituted alkyl, methoxy-substituted alkyl, oxaalkyl, thiaalkyl, azaalkyl, and ketoalkyl containing from 8 to 12 carbon atoms and $R^2$ is a substituent selected from the group consisting of low molecular weight alkyl and hydroxy-substituted alkyl.

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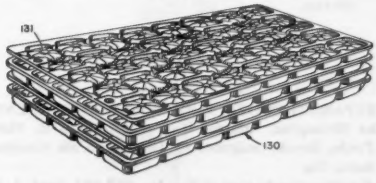
3,896,239

## BUTTER PAT PACKAGE

Leo Peters, 750 Plymouth Road SE., Grand Rapids, Mich. 49506

Filed Apr. 24, 1972, Ser. No. 247,138
Int. Cl. B65b 25/06; B65d 1/36
U.S. Cl. 426—119 3 Claims




1. A nestable and stackable tray for food pats comprising a plurality of elongated parallel channels, each channel having a flat bottom wall, a pair of side walls extending upwardly from the bottom wall, and a first and second end walls, the first end wall extending generally vertically upwardly from the bottom wall and the second end wall extending from the bottom wall away from the first end wall and forming an obtuse included angle with the bottom wall, the first end walls of the channels being aligned transversely across the tray at one end thereof and the second end walls of the channels being aligned transversely across the tray at the other end thereof, each side wall of each channel including a plurality of

longitudinally spaced projections extending toward the projections of the other side wall of the channel to form pat-confining pockets between adjacent projections, adjacent side walls of each adjacent pair of channels being spaced apart and having the upper ends joined by a top wall, the portions of the top wall extending between the projections providing flat supporting surfaces extending generally parallel to the bottom walls, the extent of the second end wall of each channel in a direction parallel to the bottom wall being about one-half the distance between adjacent pocket-forming projections, whereby a plurality of the trays may be nested by aligning the first end walls of the trays and inserting the top walls of each tray into the spaces between adjacent channels of the tray immediately thereabove and a plurality of trays can be stacked and supported out of contact with food pats contained in the pat-confining pockets thereof by aligning the first end walls of each tray with the second end walls of the trays immediately thereabove and therebelow so that the flat supporting surfaces of each tray engage and support the bottom walls of the channels of the tray immediately thereabove.

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3,896,240

## PREPARATION OF SIMULATED HUMAN MILK

Friedrich-Karl Gruette, Caputh; Juergen Schulze, Bergholz-Rehbruecke, and Heinz-Georg Hampel, Stendal, all of Germany, assignors to Akademie der Wissenschaften der DDR, Berlin, Germany

Filed Apr. 2, 1973, Ser. No. 347,345
Int. Cl. A23c *11/00*
U.S. Cl. 426—271 5 Claims

1. A process for the production of a composition that simulates human milk and which is especially suitable for the feeding of infants which comprises

a. treating whey with an anion-exchange resin charged with chloride ions to remove substantially all anions of weak acids from the said whey,

b. adding to the said treated whey a protein produced by pouring a preselected quantity of skim milk into a preselected quantity of an aqueous solution of hydrochloric acid containing only such an amount of hydrochloric acid that upon addition of the preselected quantity of the skim milk to the aqueous solution of hydrochloric acid the hydrogen-ion concentration of the resulting mixture corresponds to a pH between 4.4 and 5.1,

c. adding fats, vitamins, and minerals to the resulting mixture of protein and treated whey,

d. homogenizing the resulting mixture, and

e. subsequently adding lactose to the resulting homogenized mixture in an amount between 6 and 8% by weight of the mixture.

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3,896,241

## PREPARATION OF A WHEY PROTEIN CONCENTRATE

Alex Malaspina, Atlanta, Ga., and Roberto H. Moretti, S. Paulo, Brazil, assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 177,082, Sept. 1, 1971, abandoned. This application May 24, 1974, Ser. No. 473,258
Int. Cl. A23c *21/00*
U.S. Cl. 426—271 10 Claims

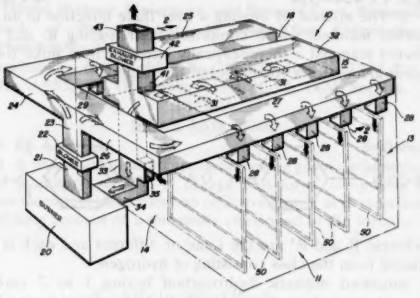
1. A process for producing a whey protein concentrate suitable for incorporation into beverages which comprises providing whey from bovine milk, passing the whey through a diatomaceous earth filter, subjecting the whey to ultrafiltration with water injection to form a whey protein concentrate and thereafter contacting the concentrate with a strongly acidic cationic exchange resin to produce a whey protein concentrate low in viable and total microbial count, low in mineral salt and having a pH in the range of 2.7–3.6.

3,896,242

## PROCESS FOR SMOKING COMESTIBLE MATERIAL

Donald G. Moore, Manitowoc, Wis., assignor to Red Arrow Products Company, Milwaukee, Wis.

Filed July 9, 1973, Ser. No. 377,456
Int. Cl.[2] A23B *4/04*
U.S. Cl. 426—314 9 Claims



7. A method of smoking a comestible product in a smokehouse having a smoking chamber, a burner for developing heat in the form of hot air, a supply duct for delivering the hot air from the burner to the smoking chamber, a blower for circulating the hot air from the burner through the supply duct to the smoking chamber, a return duct for withdrawing air from the smoking chamber and delivering it the burner, and an exhaust duct exiting from the smoking chamber, comprising;

placing a comestible product in the smoking chamber;

heating the comestible product by means of the burner and hot air produced thereby and fed with the aid of the blower to the smoking chamber to a temperature of 60° to 210°F.;

producing a liquid smoke cloud in the smoking chamber while the burner is on and the exhaust duct is closed;

withdrawing a gaseous stream of the liquid smoke cloud and heated air from the smoking chamber by means of the return duct, with the exhaust duct closed, delivering it to the burner and returning it by means of the supply duct to the smoking chamber with the blower operating substantially most of the time to facilitate said circulation of the gaseous stream, said burner being on and supply heat to the smoking chamber during at least most of such circulation of the liquid smoke cloud; and

continuing said process until the comestible product acquires an acceptable smoke flavor and smoke color.

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3,896,243

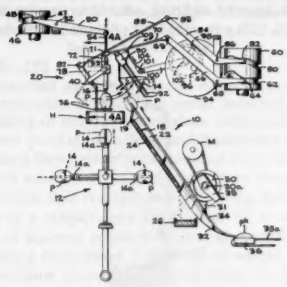
## PINEAPPLE SLITTING AND CONVEYING

Leslie Vadas, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 233,130, March 9, 1973, Pat. No. 3,760,665. This application Mar. 29, 1973, Ser. No. 345,928
Int. Cl. A23l *1/00*
U.S. Cl. 426—482 3 Claims

1. The method of processing pineapples comprising the steps of pre-coring the fruit to leave a reinforcing core shell, removing the crowns of the fruit, pushing the cored fruit vertically through a contour peeling head onto a vertical discharge pin, tilting the discharge pin, removing the butts of the fruit, and stripping the peeled, fruit off the discharge pin onto a downwardly inclined guide pin, slitting the fruit from below up to the core hole while continuing to guide the advancing fruit by their core holes and the newly formed slit,

completely halving the advancing fruit from above, guiding the halves along divergent planar paths which gradually twist



from the vertical to the horizontal, and advancing the halves cut face down along separate conveying paths.

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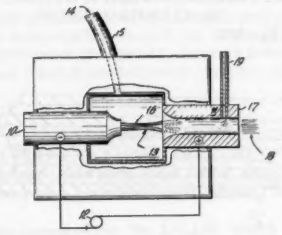
3,896,244

## METHOD OF PRODUCING PLASMA SPRAYED TITANIUM CARBIDE TOOL STEEL COATINGS

John L. Ellis, White Plains; M. Kumar Mal, Spring Valley, and Stuart E. Tarkan, Monsey, all of N.Y., assignors to Chromalloy American Corporation, New York, N.Y.

Division of Ser. No. 199,497, Nov. 17, 1971, Pat. No. 3,779,720. This application June 8, 1973, Ser. No. 368,063
Int. Cl.[2] B05D *11/10*
U.S. Cl. 427—34 7 Claims



1. A method of producing a hard, wear resistant coating of a heat treatable titanium carbide tool steel onto a metal substrate which comprises,

selecting a powder composition containing about 10 to 80% by weight of primary grains of titanium carbide and the balance essentially about 90 to 20% by weight of steel-forming ingredients which, when melted to form a steel and quenched from an austenitizing temperature, tends to form martensite,

and then spraying said powder composition with a plasma flame directly onto said metal substrate to quench-deposit a thin coating of said composition thereon of thickness ranging up to about 0.025 inch,

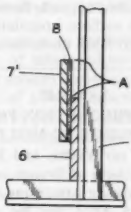
thereby producing an adherent thin coating of said titanium carbide tool steel composition on said metal substrate characterized by primary grains of titanium carbide uniformly dispersed through a matrix containing an austenitic decomposition product containing martensite, and further characterized in that said coating is capable of being heat treated at a temperature below the melting point of the metal substrate.

3,896,245

## PRESSURE SENSITIVE ADHESIVE STRIPS AND SHEETS

Kenneth Hon Seto, and James Thomas Thompson, both of Dayton, Ohio, assignors to Protective Treatments, Inc., Dayton, Ohio

Filed Apr. 4, 1973, Ser. No. 347,823
Int. Cl.[2] B32B *25/02, 25/14, 27/20*
U.S. Cl. 428—7 6 Claims




1. A permanently compressible pressure sensitive composite strand adapted for attachment to an automobile body consisting essentially of a tacky permanently compressible, nonporous cohesive base strand having a thickness of about 0.03 to 0.08 inch, said base strand having little or no resilience and constituted by elastomeric material compounded with from 0.45 to 2.5 times the weight of elastomeric material of low volatile liquid plasticizer and finely divided solids in an amount of at least 0.93 parts per part of elastomeric material, the finely divided solids including from 0.5 to 2 ½ parts, per part of elastomeric material, of finely divided bulk fibrous solids or solids that form thixotropic mixtures with the said liquid plasticizer, said base strand being coated with a pressure sensitive adhesive, and said base strand being permanently deformable by pressure above about 15 pounds per square inch, but exhibiting negligible flow at 0.6 pounds per square inch pressure.

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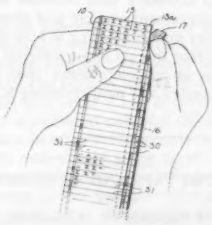
3,896,246

## STORAGE CARD FOR LABELS

William H. Brady, Jr., Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Continuation of Ser. No. 237,816, March 24, 1972, abandoned. This application Dec. 12, 1973, Ser. No. 424,034
Int. Cl. B32b *33/00;* C09j *7/02*
U.S. Cl. 428—41 3 Claims



1. In a combination including an adhesive article of the type having a layer of pressure sensitive adhesive and a storage card about 10 to 25 mils thick for supporting the adhesive article,

the improvement wherein:

the storage card is characterized as being made of a homogenous non-fibrous synthetic plastic material having (1) an Izod impact strength of about 0.5 to 3.0 foot pounds per inch of notch, (2) a tensile elongation at yield of about 1.0 to 2.5%, and (3) a tensile modulus of about 200,000 to 400,000 psi.,

the adhesive layer of the adhesive article is releasably joined to a first surface of the storage card,

the storage card is rectilinearly crackable upon a single flexion in a direction away from the adhesive article on its first surface and also flexible to permit cyclic bending without cracking and the first surface of said storage card has a smoothness with surface irregularities in the range of 0 to 15 RMS microinches underlying the pressure sensitive adhesive article supported thereon, and a second surface of the card opposite from the first surface has a smoothness with surface irregularities in the range of more than about 20 RMS microinches.

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**3,896,247**

## THERMAL SHOCK PROTECTION FOR REFRACTORY MATERIAL SUBJECT TO MOLTEN METALS

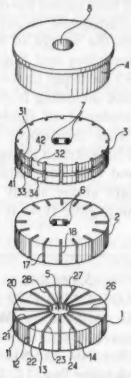
**Pierre Descleve, Bures sur Yvette, and Jean-Claude Megnin, Fontenay aux Roses, both of France, assignors to Groupement Atomique Alsacienne Atlantique, France**

**Filed Feb. 5, 1974, Ser. No. 439,786**

**Claims priority, application France, Feb. 9, 1973, 73.04667; Apr. 16, 1973, 73.13733**

**Int. Cl.[2] B32B** *1/04*; **F16J** *15/00*; **B32B** *3/14*

**U.S. Cl. 428—65** **14 Claims**



**1.** In a refractory material structure for repeated immersion in a very hot and corrosive fluid medium such as molten aluminum, the improvement wherein said element comprises a block of refractory material having at least one network of slots within the surface thereof and a material stuffing within said slots which is more compressible than the refractory material to be protected and nonpermeable to said fluid medium.

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**3,896,248**

## TENNIS MARKING TAPE AND METHOD OF MAKING SAME

**Paul E. Scarpa, 118 Highland Dr., Greensville, S.C. 29405**

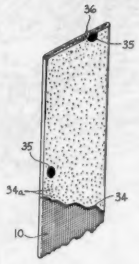
**Filed Oct. 10, 1972, Ser. No. 296,037**

**Int. Cl.[2] B05D** *5/02*; **B32B** *1/00*

**U.S. Cl. 428—172** **4 Claims**

**1.** The method of manufacturing a textured tape for use in marking tennis courts comprising: impregnating the interstices of a length of textile webbing with a liquid film forming composition; curing said liquid film forming composition; then applying a viscous tacky coating curable to form a tough film to said webbing so as to form a surface layer of coating on the impregnated webbing; moving the coated webbing relative to a smooth rotatable roller with said layer of coating in contact with said roller forming a textured surface therein by puckering said coating by the action of the roller thereon; and curing said viscous coating forming a tough textured surface thereon.

**3.** A marking tape for a tennis court comprising: a length of woven textile webbing impregnated with a film forming composition; a layer of water repellant film carried on the surface of the impregnated webbing, said layer having been applied thereto as a tacky coating and puckered while tacky to produce a textured surface in said film including a plurality of randomly spaced puckered areas covering said film; and a plurality of spaced punctures in said webbing facilitating placement of fastening means for fixing the webbing to the court with the textured surface up; whereby said textured surface avoids skipping of a tennis ball and slipping of players.



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**3,896,249**

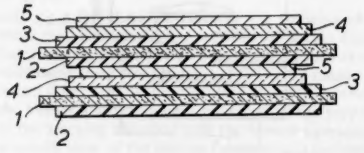
## SELF-ADHESIVE TRANSFERS

**Robert Alan Keeling, and John Garrick Priest, both of London, England, assignors to Johnson, Matthey & Co. Limited, London, England**

**Continuation of Ser. No. 175,705, Aug. 27, 1971, abandoned, which is a continuation of Ser. No. 791,091, Jan. 14, 1969, abandoned. This application Apr. 4, 1973, Ser. No. 347,629**

**Int. Cl.[2] B32B** *3/00*, *7/06*

**U.S. Cl. 428—202** **33 Claims**



**1.** In a flexible, self-adhesive transfer for applying a design to a base, said transfer including a backing sheet, release layers, a design layer, and a layer of high tack pressure-sensitive adhesive, two or more transfers being adapted to be stacked one directly upon another prior to use, the improvements comprising:

a. a backing sheet having oppositely facing first and second surfaces, a first of said surfaces being smoother than the second surface;

b. a release layer on at least a part of each surface of said backing sheet, each release layer being of the same composition but of different relative smoothness, said first and second surfaces of the backing sheet imparting their respective difference in smoothness to the release layer thereupon;

c. a design layer applied to the smoother release layer; and

d. a layer of high tack, pressure-sensitive acrylic resin adhesive applied to the design layer,

said transfer being adapted to be stacked with the adhesive layer in contact with the less smooth release layer of an adjacent transfer, said adhesive layer having a lower adhesion to the less smooth release layer than the adhesion of the smoother release layer to said design layer, thereby reducing blocking and rendering adjacent transfers separable.

3,896,250

## FLAMEPROOFING OF FABRICS

George T. Miller, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 361,706, May 18, 1973. This application June 18, 1973, Ser. No. 371,335
Int. Cl.[2] C09D 5/18
U.S. Cl. 428—272 19 Claims

1. Flameproofed synthetic fibrous material comprising a normally flammable synthetic material selected from the group consisting of poly(hexamethylene adipamide), polycaproamide, and poly(m-phenyleneisophthalamide) which material contains a flame retardant amount of a reaction product of an aqueous solution of an acid ammonium phosphate and an alkylene oxide, said reaction product having been obtained by reacting at a temperature from about 0° to about 100° centigrade, an aqueous solution of an acid ammonium phosphate containing from about 5 to about 40 weight percent of an acid ammonium phosphate selected from the group consisting of diammonium acid ortho-phosphate, mono ammonium diacid ortho-phosphates and mixtures thereof with an amount of at least one alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide which is about 0.5 to 1.5 times the weight of said acid ammonium phosphate.

9. The process which comprises the steps of treating a normally flammable synthetic polymer material selected from the group consisting of poly(hexamethylene adipamide), polycaproamide, and poly(m-phenyleneisophthalamide) with a reaction product of an aqueous solution of an acid ammonium phosphate and an alkylene oxide, said reaction product having been obtained by reacting at a temperature from about 0° to about 100° centigrade, an aqueous solution of an acid ammonium phosphate containing from about 5 to about 40 weight percent of an acid ammonium phosphate selected from the group consisting of diammonium acid orthophosphate, mono ammonium diacid ortho-phosphates and mixtures thereof with an amount of at least one alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide which is about 0.5 to 1.5 times the weight of said acid ammonium phosphate to deposit a flame retarding amount of said reaction product on the polymer material.

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3,896,251

## OUTERWEAR FABRIC TREATMENT

Dennis P. Landucci, Lake Elmo Twp., Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 232,186, March 6, 1972, abandoned. This application July 19, 1973, Ser. No. 380,702
Int. Cl. D06m 15/32, 15/52
U.S. Cl. 428—290 7 Claims

1. The process for conferring durably launderable aqueous dry-cleanable repellency to oil and water on fabrics consisting substantially completely of hydrophobic synthetic fibers consisting essentially of applying to said fabric a blend, in suitable aqueous or non-aqueous medium, in proportions of 10:90 to 95:5, of

A. fluoroaliphatic radical-containing substantially linear vinyl polymer containing from 10 to 60 percent by weight thereof of fluorine in the form of fluoroaliphatic radicals terminating in $CF_3$ groups, said fluoroaliphatic radicals containing at least three fully fluorinated carbon atoms, and

B. a solvent-soluble carbodiimide consisting essentially of from 1 to a plurality of carbodiimide groups, terminal organic radicals free from isocyanate-reactive hydrogen atoms connected to carbodiimide and, when two or more carbodiimide groups are present, polyvalent organic groups, residues of polyisocyanates, linking successive carbodiimide groups, and

thereafter vaporizing said medium whereby a coating of said blend is deposited on said synthetic fibers.

3,896,252

## PROCESS OF METAL PLATING ON PLASTICS

Carole K. Tuttle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 4, 1974, Ser. No. 439,453
Int. Cl. C23c 3/02; B44d 1/092
U.S. Cl. 427—306 21 Claims

1. A process for metallizing plastic articles formed from a rubber modified unsaturated carboxylic acid or anhydride containing thermoplastic polymer which comprises the steps of

a. aminating the surface to be metallized by contacting it with a solution of ethylenediamine or 1,3-diaminopropane in an inert solvent comprising from about 50 to 100 volume percent of a water miscible organic solvent and from 0 to about 50 percent water,

b. contacting the aminated surface with a noble metal salt solution and

c. treating said surface with a reducing agent forming a metallized surface having a resistance of about 100 ohms/sq. or less;

wherein said rubber modified polymer contains about 12 to 40 weight percent rubber, about 12 to 30 weight percent of said acid or anhydride and the balance to make 100 percent of one or more monomers copolymerized therewith and wherein said polymer is the product of polymerizing the monomers in the presence of the rubber in a finely divided form.

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3,896,253

## BONDING GLASS FIBERS TO RUBBER

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 21, 1973, Ser. No. 417,859
Int. Cl.[2] B29H 9/06, 9/10
U.S. Cl. 428—382 15 Claims

1. A glass fiber reinforcing element containing from about 10 to 40% by weight (dry) based on the weight of said element of a heat cured adhesive composition useful for adhering said element to a rubber compound and consisting essentially of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 0.5 to 20 parts by weight of silica from a stabilized colloidal silica sol in which the particles of silica have an average particle diameter of from about 1 to 150 millimicrons, and from about 10 to 75 parts by weight of a water soluble, heat reactable resorcinol-formaldehyde resole having hydroxyl and methylol groups, said resole being made by reacting an excess of formaldehyde with resorcinol, said composition coating and at least substantially totally impregnating said element.

5. A method for adhering a glass fiber reinforcing element to a rubber compound which comprises treating said element with a composition consisting essentially of an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 0.5 to 20 parts by weight of silica in the form of a stabilized colloidal silica sol in which the particles of silica have an average particle diameter of from about 1 to 150 millimicrons, from about 10 to 75 parts by weight of a water soluble, heat reactable resorcinol-formaldehyde resole having hydroxyl and methylol groups, from about 0 to 3 parts by weight of an alkaline material selected from the group consisting of $NH_4OH$, KOH and NaOH, and from about 150 to 1100 parts by weight of water, heating said treated element at a temperature and for a time sufficient to remove essentially all of the water from said composition and to provide said element with a heat cured adhesive in an amount of from about 10 to 40% by weight (dry) based on the weight of said reinforcing element, combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized vulcanizable rubber compound, and vulcanizing the same, said resole being made by reacting an excess of formaldehyde with resorcinol, said composition coating and at least substantially totally impregnating said element.

12. A bonded composite material comprising a glass fiber reinforcing element embedded in a vulcanized rubber, said element containing from about 10 to 40% by weight (dry) based on the weight of said element of a heat cured adhesive composition consisting essentially of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 0.5 to 20 parts by weight of silica from a stabilized colloidal silica sol in which the particles of silica have an average particle diameter of from about 1 to 150 millimicrons, and from about 10 to 75 parts by weight of a water soluble, heat reactable resorcinol-formaldehyde resole having hydroxyl and methylol groups and said composition forming a bond between said element and said rubber, said resole being made by reacting an excess of formaldehyde with resorcinol, said composition coating and at least substantially totally impregnating said element.

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## 3,896,254
## COATING SEMICONDUCTOR SURFACES

**Rolf Berkner, Wolkersdorf, Germany, assignor to Semikron Gesellschaft fur Gleichrichterbau u. Elektronik m.b.H., Nuremberg, Germany**

**Filed Nov. 7, 1972, Ser. No. 304,331**
**Claims priority, application Germany, Nov. 10, 1971, 2155849**
**Int. Cl.[2] B44C** *1/18;* **B05D** *5/12*
**U.S. Cl. 428—411** **12 Claims**

1. A semiconductor body of an element of Group IV of the periodic table or a compound of elements of Groups III and V of the periodic table having a surface coated with a protective oxide layer including at least one organic coloring agent, the coloring agent having a molecular configuration with conjugated double bonds and being a member of a class which promotes oxidation on exposure to light radiation having a wavelength of from 0.01 micron to 1 micron.

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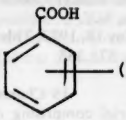
## 3,896,255
## RECORDING SHEET

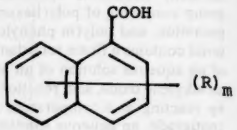
**Hajime Kato, and Takao Hayashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan**

**Filed July 13, 1973, Ser. No. 378,859**
**Claims priority, application Japan, July 14, 1972, 47-70498**
**Int. Cl.[2] B41M** *5/00*
**U.S. Cl. 428—411** **5 Claims**

1. A recording sheet which comprises a layer of a color developer which forms a color image upon contact with a color coupler, said layer containing at least one metal compound of an aromatic carboxylic acid represented by the formula:




or




wherein R may be the same or different and represents a hydrogen atom, a hydroxy group, a halogen atom, a nitro group, an alkyl group having 1 to 10 carbon atoms, the total carbon number in the R's being less than 13, an aryl group, an arylamino group or an alicyclic group, *m* is an integer of 0 to 7 and *n* is an integer of 0 to 5, or said aromatic carboxylic acid may be dimerized through the substituent R as a methylene group, and a surface active agent.

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## 3,896,256
## PROCESS FOR IMPROVING THE SOLDERABILITY OF A STAINPROOFED COPPER SURFACE AND PRODUCT

**Adam M. Wolski, Edgewater Park, N.J., assignor to Yates Industries, Inc., Bordentown, N.J.**

**Filed Dec. 1, 1972, Ser. No. 311,308**
**Int. Cl.[2] B23B** *15/04*
**U.S. Cl. 428—457** **16 Claims**

1. A continuous process for treating copper foil comprising the steps of:

stainproofing the copper foil by immersing the copper foil in an aqueous electrolyte containing hexavalent chromium ion-containing anions and rendering said copper foil cathodic to produce a stainproofed surface, said aqueous electrolyte being sufficiently alkaline to cause precipitation of copper and chrome cations;

coating the stainproofed surface with a compound which, at soldering temperatures, will react with the stainproofing coating to expose the copper; and

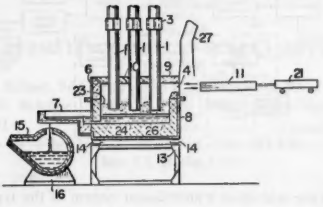
drying the stainproofed surface.

3,896,257

## ELECTRIC ARC FURNACE FOR MELTING METALS AND METAL MELTING METHOD USING SUCH FURNACE

Sadamu Kinoshita, No. 389, 7-chome, Ohzumachi Hiroshima, Japan

Continuation-in-part of Ser. No. 122,463, March 9, 1971, abandoned. This application Jan. 12, 1973, Ser. No. 323,129
Claims priority, application Japan, Sept. 24, 1970, 45-83233; Sept. 24, 1970, 45-83234
Int. Cl. F27d 3/10
U.S. Cl. 13—33 6 Claims



1. An enclosed electric arc furnace for melting materials comprising:

a main furnace body comprised of separable upper and lower portions,

a row of electrodes mounted in said upper portion of said main furnace body, said electrodes arranged so that taken together they define a substantially straight line along said main furnace body,

combined exhaust and charging means in said upper portion of said main furnace body, said combined exhaust and charging means positioned to permit raw materials to be distributed along the entire length of said row electrodes while simultaneously allowing dust and smoke generated within said main furnace body to be quickly exhausted therefrom,

a dust and smoke collecting hood positioned adjacent and above said combined exhaust and charging means for collecting said dust and smoke generated within said main furnace body,

said combined exhaust and charging means includes two identical apertures formed in said main furnace body,

alternating raw material feeding means for alternatively supplying raw materials to said furnace through one then the other of said two identical apertures whereby the aperture not receiving raw materials remains open for direct exhaustion of said dust and smoke to said dust and smoke collecting hood, and

tapping means located in said lower portion of said main furnace body for withdrawing molten materials from said furnace.

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3,896,258

## ELECTRON BEAM GUN SYSTEM

Charles W. Hanks, 26 Camino Del Diablo, Orinda, Calif. 94563

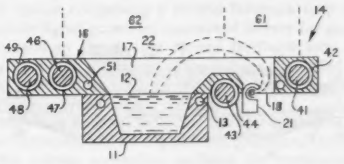
Continuation-in-part of Ser. No. 393,904, Sept. 4, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 465,087
Int. Cl. H01j 37/14
U.S. Cl. 13—31 15 Claims

1. An electron beam gun system for an electron beam furnace comprising

first and second electromagnets disposed in substantially parallel spaced relation,

an electron gun disposed between and below said first and second electromagnets,

a third electromagnet disposed in substantially parallel spaced relation to said second electromagnet and adapted to have a crucible or the like disposed therebetween for electron bombardment of material contained therein, and controllable energization means connected to each of said electromagnets for establishing a first variable magnetic lens between said first and second electromagnets and a second variable magnetic lens between said second and third electromagnets



whereby electrons emitted from said electron gun are controllably focused into a beam of variable cross section at said crucible.

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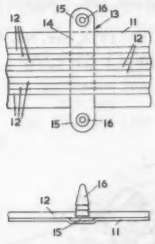
3,896,259

## WIRING HARNESS WITH MOUNTING DEVICE AND METHOD OF MAKING SAME

William Lawrence Fry, Haughton, England, assignor to Rist's Wires & Cables Limited, Birmingham, England

Filed Jan. 29, 1974, Ser. No. 437,698
Claims priority, application United Kingdom, Feb. 13, 1973, 7112/73
Int. Cl. H02g 3/02
U.S. Cl. 174—72 A 3 Claims



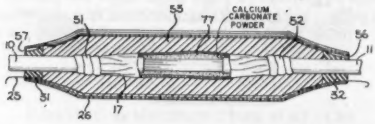
2. A wiring harness including a thermoplastic backing strip, at least one conductive lead comprising a conductive core within a thermoplastic sheath, said sheath being fused to the backing strip to secure the lead to the backing strip, and, a mounting device whereby the harness can be mounted on a support panel or the like in use, the mounting device including a member formed from thermoplastic material held against movement relative to the backing strip and the lead by being fused to the backing strip, and, the mounting device further including an element extending outwardly from the backing strip for attachment to the support panel or the like.

3. A method of manufacturing a wiring harness including the steps of positioning at least one lead having a conductive core in a thermoplastic sheath, on a platform, engaging with the lead a thermoplastic member of a mounting device so that the member overlies part of the lead, and engaging with the lead along its length, and at least that portion of the member overlying the lead, a thermoplastic backing strip while heating the mutually presented surfaces of the lead, the member, and the backing strip so that the sheath of the lead and said member fuse to the backing strip.

## 3,896,260
## POWDER FILLED CABLE SPLICE ASSEMBLY

Walter A. Plummer, 3546 Crownridge Dr., Sherman Oaks, Calif. 91403

Continuation-in-part of Ser. No. 347,435, April 3, 1973, Pat. No. 3,836,702. This application Sept. 16, 1974, Ser. No. 506,599
Int. Cl. H02g 15/08
U.S. Cl. 174—92 12 Claims




1. An electrical cable splice assembly protecting a plurality of spliced conductors in a cable comprising:
   a. an inner cover disposed about said conductors in said cable;
   b. a protective powder disposed within said inner cover;
   c. an outer jacket disposed about said inner cover and said conductors, said conductors passing through corresponding apertures in first and second ends of said outer jacket;
   d. means sealing said apertures; and
   e. an insulative foam material disposed within the space between said outer jacket and said sealing means; whereby said splice assembly protects said conductors from the elements.

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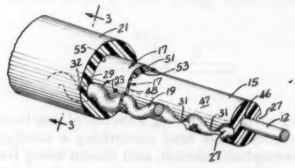
## 3,896,261
## COAXIAL CABLE WITH AN UNDULATED DRAIN WIRE

Robert B. Cole, Richmond, Ind., assignor to Belden Corporation, Geneva, Ill.

Filed Apr. 15, 1974, Ser. No. 460,718
Int. Cl. H01b 7/00
U.S. Cl. 174—115 4 Claims

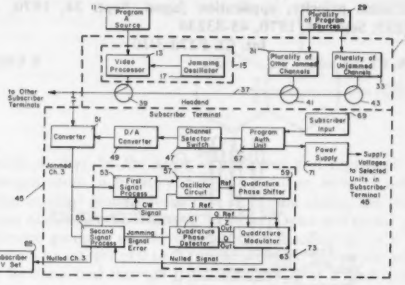



1. A coaxial cable having a drain wire with resistance to slipping comprising an elongated central conductor extending longitudinally of the cable, a surrounding layer of insulating material in contact with said central conductor, a conductive shield surrounding said layer of insulating material and in contact therewith, an outer surrounding protective jacket of insulating material disposed about said conductive shield, an undulated drain wire in contact with said conductive shield and having a number of undulations and disposed between said jacket and said insulating layer, an undulating groove formed in said insulating layer and having one side of said undulated drain wire projecting therein, and an undulating groove formed in said jacket receiving the other side of said drain wire therein.

## 3,896,262
## SUBSCRIPTION TELEVISION JAMMING SYSTEM

Thomas Hudspeth, Malibu; Harold A. Rosen, Santa Monica, and Bernard L. Walsh, Jr., Northridge, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 21, 1974, Ser. No. 453,223
Int. Cl.[2] H04N 1/44
U.S. Cl. 178—5.1 6 Claims




4. A secure television transmission system of the type having at least one source of program signals, said program signals each including a carrier having video modulation impressed thereon and extending over a given video sideband, at least one source of jamming signals having a frequency within said video sideband, an extended signal transmission path, first means for coupling said program and said jamming signal to said transmission path, at least one subscriber receiver, and second means coupled between said transmission path and said subscriber receiver for substantially eliminating said jamming signal wherein the improvement comprises;

second means which includes a first and second phase-locked loop, said first phase-locked loop being adapted to provide a replica of said jamming signal and said second phase-locked loop being adapted to combine the replica of said jamming signal with said jamming signal in phase opposition.

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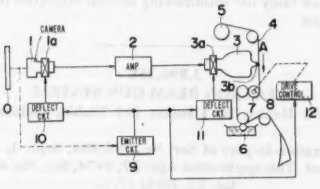
## 3,896,263
## SYSTEM FOR RECORDING PHOTO-IMAGES OF AN OBJECT

Yoshizo Ikegami, Amagasaki, Japan, assignor to Konan Camera Research Institute, Japan

Filed Apr. 18, 1973, Ser. No. 352,462
Claims priority, application Japan, Apr. 20, 1972, 47-39932; Apr. 25, 1972, 47-41520; July 25, 1972, 47-74306
Int. Cl. H04n 1/00, 5/76
U.S. Cl. 178—6.8 11 Claims




1. A photo-image recording system for obtaining a continuous series of photographs produced on the surface of a photosensitive recording material comprising camera tube means for constantly scanning a line covering a location of an object being photographed in which the position of the object relative to the camera tube means changes and for providing an

output of video signal indicative of the photographed object, pulse emitter means responsive to the change in relative position between the object and the camera tube means for providing an output signal having a pulse repetition frequency corresponding to the amount of change, image reproducing means for converting the video signal of the camera tube means into optical signals on the surface of a photosensitive recording material, and drive means for moving the recording material in a predetermined direction past the image reproducing means, the pulse emitter means supplying the output signal thereof to the camera tube means, the image reproducing means and the drive means for synchronizing the sweeps of the camera tube means, the image reproducing means and the moving speed of the recording material with the pulse repetition frequency corresponding to the change of relative position between the camera tube means and the object.

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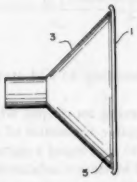
### 3,896,264
### LONG PERSISTENCE DISPLAY SCREEN SUPPLEMENT TO CRT

**Donald Reiser, 5647 Ravenel Ln., Springfield, Va. 22151, and Ralph Belcher, 10603 Lorain Ave., Silver Spring, Md. 20901**

**Filed Dec. 3, 1973, Ser. No. 421,042**
**Int. Cl. H04n** *5/72*
**U.S. Cl. 178—7.8** **11 Claims**




7. A long persistence display system comprising:
a cathode ray tube; and
a flexible screen comprising a flexible binder impregnated with a long persistence phosphor, said flexible screen being placed directly on the outside of the face plate of said cathode ray tube.

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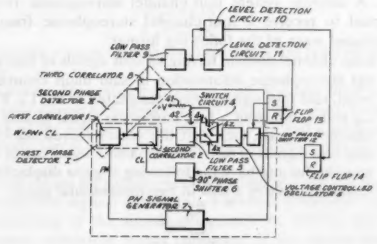
### 3,896,265
### FRAME SYNCHRONIZATION SYSTEM

**Takao Hara, and Yukio Murayama, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Oct. 26, 1973, Ser. No. 410,169**
**Claims priority, application Japan, Nov. 6, 1972, 47-110961**
**Int. Cl. H04l** *7/04, 27/14*
**U.S. Cl. 178—69.5 R** **7 Claims**




1. A frame synchronization system for input signals comprising a combination of false random signals and clock signals, a first phase detector having an input supplied with the input signals, the first phase detector comprising a first correlator and a second correlator and having other inputs and an output, a voltage controlled oscillator having an input selectively coupled to the output of the first phase detector, the voltage controlled oscillator having an input, a first feedback circuit comprising a first feedback loop and a 90° phase shifter circuit connected therein for shifting output signals of the oscillator 90° in phase, the first feedback loop being connected between the output of the voltage controlled oscillator and another input of the first phase detector and a second feedback circuit comprising a second feedback loop and a false random signal generator connected therein for generating false random signals, the second feedback loop being connected between the output of the voltage controlled oscillator and still another input of the first phase detector, the frame synchronization system comprising
a second phase detector including the first correlator and a third correlator and having an input coupled to the output of the voltage controlled oscillator for correlating the input signals with the output of the voltage controlled oscillator, the second phase detector having an output;
a first level detection circuit having an input coupled to the output of the second phase detector for detecting a specific level of positive polarity of the output of the second phase detector, the first level detection circuit having an output;
a source of constant voltage; and
a switch circuit having an armature connected to the input of the voltage controlled oscillator, a first contact coupled to the output of the first phase detector and a second contact connected to the source of constant voltage, the switch circuit being coupled to the output of the first level detection circuit whereby the armature of the switch circuit selectively contacts the first and second contacts in accordance with specific levels of positive polarity detected by the level detection circuit.

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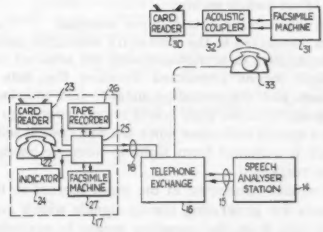
### 3,896,266
### CREDIT AND OTHER SECURITY CARDS AND CARD UTILIZATION SYSTEMS THEREFORE

**Nelson J. Waterbury, 400 Coconut Row, Palm Beach, Fla. 33480**

**Continuation-in-part of Ser. No. 169,906, Aug. 9, 1971, Pat. No. 3,752,904. This application June 2, 1972, Ser. No. 259,248**
**Int. Cl. G10l** *1/04*
**U.S. Cl. 179—1 SB** **16 Claims**




1. A security card utilization system comprising:
a plurality of security cards, each having data recorded thereon relating to the voice characteristics of a respective authorized card holder;
at least one reading transducer adapted to read said data of any one of said cards presented thereto and to produce a first group of electrical signals which contain said data;
a first recording means comprising a first magnetic tape loop and a first recording head operative to receive and record said first group of electrical signals on said first tape loop;

at least one acoustical transducer responsive to the voice of any person and operative to produce a second group of electrical signals representative of the voice of such person;

a second recording means comprising a second magnetic tape loop and a second recording head operative to receive and record said second group of electrical signals on said second tape loop;

first and second pickup means operative to read said first and second tape loops respectively and produce first and second output signals therefrom; and

at least one comparator connected to said first pickup means and to said second pickup means to receive said first and said second groups of output signals therefrom and operative to effect a comparison thereof to indicate whether or not said person is the authorized holder of said one card.

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## 3,896,267

## TELECOMMUNICATIONS SYSTEM FOR THE HEARING IMPAIRED UTILIZING BAUDOT-ASCII CODE SELECTION

**Reynold Sachs, McLean, Va., and Frank Cicchiello, Norristown, Pa., assignors to Phonics Corporation, Silver Spring, Md.**

**Filed Sept. 21, 1973, Ser. No. 399,553**
**Int. Cl. H04h** *11/06*
**U.S. Cl. 179—2 TV** **9 Claims**

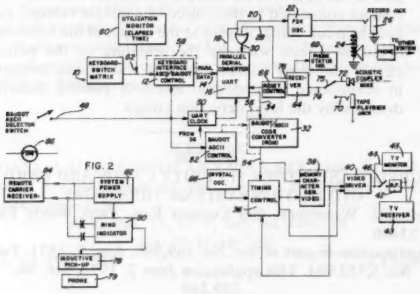

FIG. 2

1. In a telecommunication data terminal for selectively transmitting data in one of at least first and second codes, the terminal comprising:

code select switch means;

means for entering data into the terminal;

means connected to the data entry means for encoding the entered data in accordance with the selected code;

interface means connected between the data entering means and the encoding means, said interface means responsive to the code select switch means, for interposing a special indication when the first code is selected and there is a change from alpha to numeric characters and vice versa;

clock means connected at the input thereof to the switch means for generating timing signals which control the data rate from the encoding means in accordance with the selected code;

transducer means connected to the output of the encoding means for coupling encoded data to a telephone for transmission over telephone lines to another station at a data rate determined by the clock means;

means for visually displaying the entered data at the terminal as it is transmitted to another station, the displaying means including:

means connected to the output of the encoding means and the code select switch means for converting encoded data in the first code format to the second code format for internal processing;

memory means connected to the converting means for storing the data therefrom;

means connected to the output of the memory means for generating video data therefrom corresponding to the entered data;

means for generating video display synchronizing signals;

signal mixing means for mixing the video data with video synchronizing signals and producing a composite video signal; and

output means whereat the composite signal is present for connection to a video display which displays the entered data.

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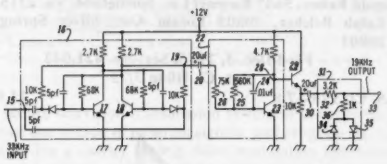
## 3,896,268

## CIRCUIT FOR GENERATING A STEREO PILOT SIGNAL

**Ramer W. Streed, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.**

**Filed May 29, 1973, Ser. No. 364,961**
**Int. Cl. H04h** *5/00*
**U.S. Cl. 179—15 BT** **3 Claims**



1. A circuit for generating an FM stereo pilot signal comprising

a flip-flop circuit having an output which changes state in response to a negative transition of the input,

means for applying to said input a signal equal in frequency and phase to an FM stereo subcarrier signal,

an integrator circuit having an input and an output,

means coupling said output of said flip-flop circuit to said input of said integrator circuit,

a wave-shaping circuit having an input and an output, and means coupling said output of said integrator circuit to said input of said wave-shaping circuit,

whereby the signal developed at the output of said wave-shaping circuit is equal in frequency to one-half the frequency of said subcarrier signal and is in phase therewith.

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## 3,896,269

## FOUR CHANNEL STEREOPHONIC BROADCASTING SYSTEM AND RECEIVING DEVICE

**Mayumi Cho, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed May 29, 1973, Ser. No. 364,476**
**Claims priority, application Japan, June 6, 1972, 47-56391**
**Int. Cl. H04h** *5/00*
**U.S. Cl. 179—15 BT** **8 Claims**

1. A discrete system four-channel stereophonic receiver adapted to receive a four-channel stereophonic frequency modulated wave of the following format:

a main channel domain having all four signals of four-channel stereophonic information in said main channel domain, said four signals being designated as $R_F$, $L_F$, $R_B$ and $L_B$ and comprising a first composite signal in said main channel domain such that the vector representations of said four signals of said first composite signal are of equal magnitudes and have the following angular displacements from the positive x-axis in two-dimensional space:

$R_F<0°$

$L_F<0°$

$R_B<+45°$

$L_B<-135°$

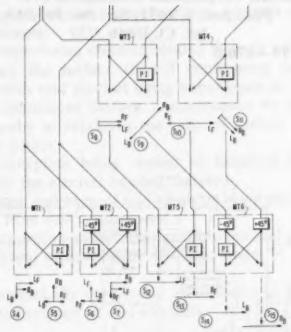
a first sub-channel domain having all four signals of four-channel stereophonic information in said first sub-chan-

nel domain, said four signals comprising a second composite signal in said first sub-channel domain such that the vector representations of said four signals of said second composite signal are of equal magnitudes and have the following angular displacements from the positive x-axis in two-dimensional space:

$R_F$<180°
$L_F$<0°
$R_B$<−45°
$L_B$<−45°

a second sub-channel domain having all four signals of four-channel stereophonic information in said second sub-channel domain, said four signals comprising third and fourth composite signals in said second sub-channel domain such that the vector representations composite signal are of equal magnitudes and have the following angular displacements from the positive x-axis in two-dimensional space:

$R_F$<0°
$L_F$<0°
$R_B$<−135°



$L_B$<+45°

and the vector representations of said four signals of said fourth composite signal are of equal magnitudes and have the following angular displacements from the positive x-axis in two-dimensional space:

$R_F$<180°
$L_F$<0°
$R_B$<+135°
$L_B$<+135°

said discrete system four-channel stereophonic receiver comprising:

first means for matrix-processing said first and third composite signals to generate a fifth composite signal consisting of the signals designated $R_F$ and $L_F$ and a sixth composite signal consisting of the signals designated $R_B$ and $L_B$,

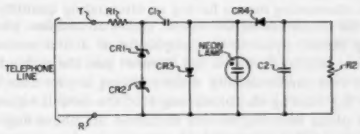
second means for matrix-processing said second and fourth composite signals to generate a seventh composite signal consisting of the signals designated $R_F$ and $L_F$ and an eighth composite signal consisting of the signals designated $R_B$ and $L_B$, and

combining means for receiving said fifth, sixth, seventh and eighth composite signals and deriving therefrom four independent sound signals $R_F$, $L_F$, $R_B$, and $L_B$.

## 3,896,270
## RINGING SIGNAL DETECTOR CIRCUIT

**Thomas J. Kopec, Arlington Heights, and Richard A. Morstadt, Elmhurst, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.**

**Filed Dec. 7, 1973, Ser. No. 422,809**
**Int. Cl.² H04M *1/26***
**U.S. Cl. 179—84 L** **8 Claims**




1. A ringing signal detector circuit connected to a telephone line, said line including a pair of line conductors subject to the impression thereon of dial pulses and line voltage, said line voltage polarity being reversable, said ringing signal detector circuit operable in response to ringing signals received over said line, said detector circuit comprising: a neon lamp; a peak-limiting network connected between said lamp and said line, operable to prevent operation of said lamp in response to dial pulses; a voltage doubler network connected between said peak-limiting network and said lamp, operated in response to said ringing signals to operate said lamp; and a battery reversal suppressor network connected to said line in parallel with said lamp, operable to absorb transient energy caused by reversal of the polarity of said line voltage impressed on said telephone line.

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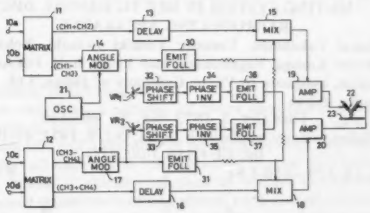
## 3,896,271
## SYSTEM FOR A MULTICHANNEL RECORD DISC WITH CROSSTALK COMPENSATION PROVIDED DURING RECORDING

**Yukinobu Ishigaki, Yamato; Isao Ohwaki, Tokyo; Kohei Sasamura, Sagamihara, and Masahiro Ohba, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed May 2, 1973, Ser. No. 356,378**
**Claims priority, application Japan, May 2, 1972, 47-43260**
**Int. Cl. G11b *3/00, 3/74***
**U.S. Cl. 179—100.4 ST** **4 Claims**




1. A multichannel disc system for recording first and second channels on a left groove wall and third and fourth channels on a right groove wall of a phonograph record, said system comprising:

a. first matrix means for forming a first sum signal and a first difference signal responsive to said first and second channel signals;

b. second matrix means for forming a second sum signal and a second difference signal responsive to said third and fourth channel signals;

c. first modulating means for angularly modulating a carrier wave responsive to the first difference signal to produce a first angular modulated wave;

d. second modulating means for angularly modulating the carrier wave responsive to the second difference signal to produce a second angular modulated wave;

e. first attenuating means for attenuating the first angular modulated wave;

f. first phase-shifting means for shifting the phase of the output signal of said first attenuating means;

g. first phase-inverting means for inverting the phase of the output signal of said first phase-shifting means;

said first attenuating means having an attenuating quantity for making the amplitude of the output signal of said first phase-inverting means equal to the amplitude of a first crosstalk component leaking from the left channel into the right channel; said first phase-shifting means having a phase-shifting quantity for causing the phase angle of the output signal of said first phase-inverting means to cancel the phase angle of the first crosstalk component;

h. second attenuating means for attenuating the second angular modulated wave;

i. second phase-shifting means for shifting the phase of the output signal of said second attenuating means;

j. second phase-inverting means for inverting the phase of the output signal of said second phase-shifting means;

said second attenuating means having an attenuating quantity for making the amplitude of the output signal of said second phase-inverting means equal to the amplitude of a second crosstalk component leaking from the right channel into the left channel; said second phase-shifting means having a phase-shifting quantity for causing the phase angle of the output signal of said second phase-inverting means to cancel the phase angle of the second crosstalk component;

k. first mixing means for mixing and multiplexing the first direct-wave sum signal, the first angular modulated wave and the output signal of said second phase-inverting means;

l. second mixing means for mixing and multiplexing the second direct-wave sum signal, the second angular modulated wave and the output signal of said first phase-inverting means; and

m. recording means for recording the output signal of said first and second mixing means on the left and right channel sides, for simultaneously recording the output signal of said first mixing means on the left wall of a groove of a record disc and the output signal of said second mixing means on the right wall of the groove.

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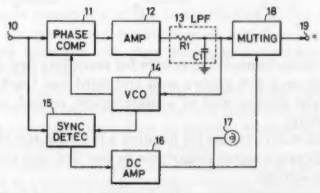
**3,896,272**

## MUTING SYSTEM IN MULTICHANNEL DISC REPRODUCING APPARATUS

**Nobukai Takahashi, Yamato; Yoshiki Iwasaki, Yokohama; Masao Kasuga, Sagamihara, and Yasuo Itoh, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Oct. 3, 1973, Ser. No. 403,165**
**Claims priority, application Japan, Oct. 9, 1972, 47-101262**
**Int. Cl. G11b** *3/00, 3/74*
**U.S. Cl. 179—100.4 ST** **8 Claims**




1. A muting system in a multichannel disc reproducing apparatus, said system comprising:

a phase locked loop circuit means including a phase comparator means operated responsive to the receipt of an angular modulated wave reproduced from a multichannel disc having recorded thereon a multiplexed signal including an angular modulated wave signal and a direct wave signal; a voltage controlled oscillator means operated responsive to an output signal from said phase comparator means to produce an output oscillation signal having an oscillation frequency controlled by said output signal, means for supplying said output oscillation signal to said phase comparator means, said phase locked loop circuit operating to demodulate said angular modulated wave;

synchronous detector means jointly responsive to said angular modulated wave and the output oscillation signal of said voltage controlled oscillator for producing a specific output when said phase locked loop circuit is locked to the input reproduced angular modulated wave during normal demodulation operation; and

muting means operating in response to said said specific output of said synchronous detector means to carry out a gating operation and thereby introduce an output demodulated signal of said phase locked loop circuit to a succeeding stage.

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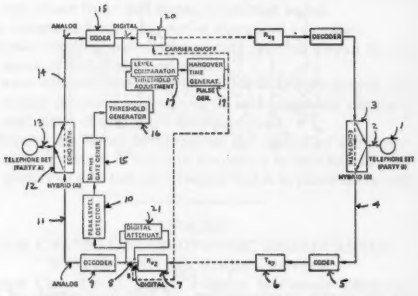
**3,896,273**

## DIGITAL ECHO SUPPRESSOR

**Ettore Fariello, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.**

**Filed Jan. 8, 1971, Ser. No. 105,069**
**Int. Cl. H04b** *3/20*
**U.S. Cl. 179—170.6** **14 Claims**




1. In a communications system having a four-wire transmission circuit connected to a two-wire circuit via a terminal, apparatus for suppressing echo comprising:

a. means for detecting the amplitude level of a signal being received on the receive line of said four-wire circuit;

b. means, connected to said detection means, for generating a threshold level which is a predetermined value less than said detected amplitude level;

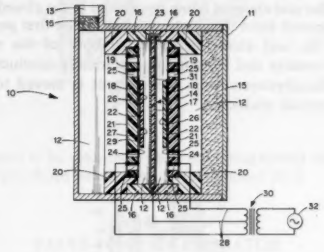
c. means, connected to said generating means, for storing, for a predetermined period of time, said threshold level and comparing the amplitude of a signal on the transmit line of said four-wire circuit to said stored threshold level, and

d. means, connected to said means for comparing, for maintaining the transmit line of said four-wire circuit disabled if the signal amplitude on the transmit line is less than said stored threshold level.

## 3,896,274
## ELECTRET EARPHONE

**Freeman W. Fraim, Lexington, Mass., and Preston V. Murphy, Barcelona, Spain, assignors to Thermo Electron Corporation, Waltham, Mass.**

**Filed Oct. 4, 1973, Ser. No. 403,573**
**Int. Cl. H04r** *19/00*
**U.S. Cl. 179—111 E** **11 Claims**

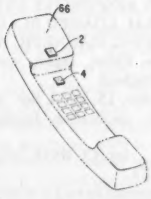


1. An electroacoustic transducer comprising:
a thin, substantially flexible electrically conductive diaphragm;
a pair of rigid backplates positioned on opposite sides of said diaphragm;
a separate imperforate electret bonded to each said backplate along the surface thereof confronting said diaphragm, each said electret being imperforate to provide a single continuous surface uninterrupted by perforations, thereby to maximize the ratio of surface area of perimeter length;
each said backplate being vented at locations not obstructed by the electret bonded thereto;
said diaphragm and each of said electrets being electrically insulated from one another;
means for supporting said diaphragm between said electrets with sufficient clearance for said diaphragm to vibrate; and
means for electrically connecting individually to said diaphragm and to each of said electrets.

## 3,896,275
## TELEPHONE LINE SWITCH

**James Wilson, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Aug. 22, 1974, Ser. No. 499,763**
**Int. Cl.[2] H04M** *1/02*
**U.S. Cl. 179—158 R** **7 Claims**

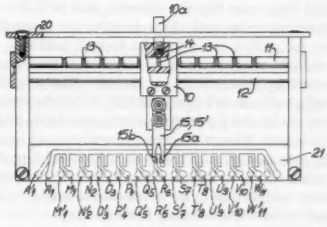


1. A telephone line switch comprising contacts for effecting a connection with a telephone line when said contacts are in a closed position and opening said connnection when said contacts are in an open position, and operating card means for moving said contacts between said closed and open positions characterized in that said line switch includes:
first means including a first pushbutton for operating said card means to move said contacts between said closed and open positions when said first pushbutton is moved from first to second positions, respectively, and conversely;
a magnetic latching means for latching said first pushbutton in said second position to hold said contacts in said open position;
second means including a second pushbutton operable between first and second positions for releasing said magnetic latching means if said first pushbutton is latched in said second position when said second pushbutton is operated from said first position to said second position and for moving said first pushbutton into said second position without engaging said magnetic latch if said first pushbutton is in said first position when said second pushbutton is operated from said first position to said second position; and
means for biasing said first and second pushbuttons toward respective said first positions.

## 3,896,276
## MATRIX TYPE SLIDE SWITCH ASSEMBLY

**George Held, Neuchatel, Switzerland, assignor to Compagnie Industrielle Radioelectrique, Switzerland**

**Filed Nov. 8, 1973, Ser. No. 413,943**
**Claims priority, application Switzerland, Mar. 13, 1973, 3672/73**
**Int. Cl. H01h** *15/06*
**U.S. Cl. 200—16 R** **1 Claim**

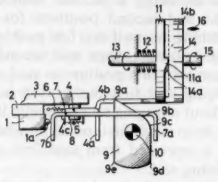


1. A switch, comprising;
a frame which has a plurality of plates disposed in planes parallel to one another, each plate having a pair of first conductors and a plurality of terminals of each first conductor, all disposed in the respective planes; said frame also having a plurality of pairs of second conductors disposed transversely of said planes, each second conductor having a plurality of terminals also disposed in said planes, including a pair of terminals for each plate, adjacent terminals of the first conductors on the plate;
a plurality of slide means, one for each plate and each mounted for individual linear movement along the respective pair of first conductors into any one of a plurality of determined positions aligned with the second conductors; and
contact means on each slide means, each for connecting a selected terminal of a second conductor with the corresponding terminal of a first conductor and for thereby interconnecting two or more of said pairs of first conductors by elements of said second conductors when respective slide means are in corresponding ones of said positions.

## 3,896,277
## TIME SWITCH MECHANISM WITH AUTOMATIC AND/OR MANUAL ACTUATING ASSEMBLY

**Jusuke Yaginuma, Koriyama, Japan, assignor to Copal Company Limited, Japan**

**Filed Mar. 25, 1974, Ser. No. 454,228**
**Claims priority, application Japan, Apr. 9, 1973, 48-42526**
**Int. Cl. H01h** *43/10*
**U.S. Cl. 200—38 R** **2 Claims**



1. Time switch mechanism adapted to actuate a switch either automatically by means of a clock mechanism at a manually set, predetermined time or manually at a desired time, wherein the improvement comprises a timer cam actuated by said clock mechanism at a manually set, predetermined time, a timer lever coupled with said timer cam so as to be actuated by the actuation of said timer cam, a switch lever coupled with said timer lever and said switch for actuating said switch by the actuation of said timer lever, and a manually operable switching cam engageable with said timer lever as well as said switch lever by the operation thereof, said switching cam being so configured that, when moved to its first position, it is disengaged from said timer lever as well as said switch lever so as to permit said timer lever to be actuated by said timer cam thereby allowing said switch to be automatically actuated by said clock mechanism through said switch lever and, when moved to its second position, engages and arrests said timer lever so as to prevent the same from being actuated by said timer cam thereby disabling the automatic actuation of said switch by said clock mechanism, while, when moved to its third position, it engages both said timer lever and said switch lever thereby preventing said timer lever from being actuated by said timer cam for disabling the automatic actuation of said switch by said clock mechanism while it permits said switch to be actuated manually by the actuation of said switch lever to said third position.

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## 3,896,278
## FREEZER MONITOR THERMAL RESPONSIVE SWITCH WITH GRAVITY ACTUATED PLUNGER CONTACT RETAINED BY FREEZABLE LIQUID IN OPEN SWITCH POSITION

**Stephen Murawski, and Bernard J. McKairnes, both of 1846 E. Schiller St., Philadelphia, Pa. 19134**

**Filed Jan. 8, 1974, Ser. No. 431,747**
**Int. Cl. H01h** *37/74*
**U.S. Cl. 200—52 R** **5 Claims**

1. In a freezer monitor switch positioned within a freezer, the combination of

A. a hollow body having one closed end and one closed contact containing end;

B. an electrically conductive element positioned within the body,

1. the conductive element comprising an elongated body and a contact head, the contact head having a diameter to readily slide within the hollow body,

2. said element being movable from a first position to a second position, the first position being above the second position;

C. a quantity of freezable liquid contained within the body;

a. said liquid being frozen to a solid state by operation of the freezer,

b. the said liquid when in the solid state maintaining the element in its first position,

c. the said liquid melting to the liquid state upon freezer failure to release the element,

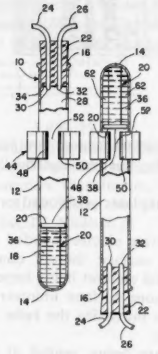
d. the element falling by gravity from the first position to the second position upon freezer failure;

D. a pair of spaced electrical contacts positioned at the contact containing end,

1. the contacts extending into the interior space,

2. the said element being positioned at the closed end and spaced from the contacts when in the first position,

3. the said element contacting both of the electrical contacts and forming an electrically conductive path therebetween when the element is moved to its said second position,



E. a bracket mounted interiorly of the freezer,

1. said hollow body being removably mounted on the bracket,

2. the hollow body being initially mounted within the freezer with the closed end down and the contact containing end up,

3, the said freezable liquid and conductive element initially falling to the said closed end and the action of the freezer freezing the liquid and entrapping the conductive element at the closed end,

4. the hollow body being then removed from the bracket and being rotated through 180° within the freezer after the liquid is frozen to position the closed end vertically above the contact containing end and being remounted on the bracket.

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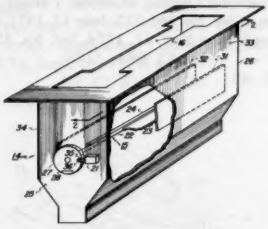
## 3,896,279
## TONER LEVEL DETECTOR ASSEMBLY INCLUDING MAGNETICALLY RESPONSIVE SWITCH ACTUATED BY DIFFERENTIAL LOADED BLADE TYPE ROTOR CARRYING MAGNETIC ACTUATOR

**Kiyoshi Sugawara, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England**

**Filed Mar. 15, 1974, Ser. No. 451,628**
**Claims priority, application Japan, Sept. 5, 1973, 48-103485**
**Int. Cl. H01h** *36/00*
**U.S. Cl. 200—61.21** **5 Claims**

1. In a toner dispenser having a reservoir for storing a supply of toner, a detector for sensing impending exhaustion of the toner supply; said detector comprising the combination of a rotor journalled in opposed ends of said reservoir with a plurality of blades of different surface areas extending therefrom to be differentially loaded by toner when said supply is above a predetermined level, bias means for urging said rotor to rotate against said differential loading, actuating means mounted for rotation with said rotor along a predetermined

path, a switch, and means for supporting said switch in a predetermined position relative to said path so that said switch



is positioned to be actuated by said actuating means when said toner supply drops below said predetermined level.

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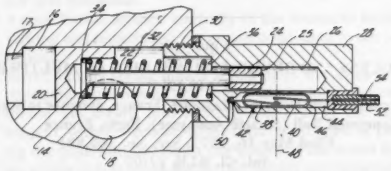
## 3,896,280
## VALVE POSITION INDICATOR

**Douglas O. Blake, Newton, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Mar. 13, 1974, Ser. No. 450,715**
**Int. Cl. H01h** *35/40*
**U.S. Cl. 200—81.9 M** **1 Claim**



1. In an engine lubricating system having an oil filter mounted on a base to receive dirty oil from a first passage therein and to discharge clean oil to a second passage therein; said base having a first sealable bore therein which forms a pressure relief passage between the first and second passages; a pressure-responsive plunger slidably disposed in said bore to move between a first closed position preventing flow through the relief passage and a second open position permitting flow through the relief passage; and a compression coil spring biasing the plunger toward the first passage in opposition to the pressure drop created across the first and second passages by the oil filter, whereby the plunger moves to its open position only when the filter is sufficiently obstructed to generate abnormally high oil pressures on the upstream face of said plunger:

the improvement comprising means for indicating an open condition of the plunger; said indicating means comprising an elongated cap member attached to the oil filter base to seal the open end of said first bore; said cap member having a second internal bore forming an axial continuation of the base bore, and a third external bore parallel to the axis defined by the first and second bores; said plunger being equipped with a special stem that projects therefrom into the second internal bore formed in the cap member; a magnet operator carried on a section of the stem within the cap member internal bore for reciprocatory movement with the stem and plunger; the aforementioned coil spring being located so as to surround the stem in the axial space between the plunger and a shoulder defined by the cap member internal bore; and a reed switch located within the third external bore of the cap member for actuation by the magnet operator; said magnet operator being movable by the stem so that the switch contacts are closed as soon as the pressure-relief plunger begins to crack open in response to abnormally high pressures generated on the upstream face of the plunger.

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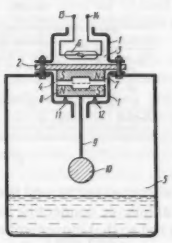
## 3,896,281
## MAGNETICALLY ACTUATED LIQUID LEVEL SIGNALLING DEVICE

**Evgeny Ilich Feoktistov, Prospekt Oktyabrya, 53, kv. 75; Evgeny Arkadievich Chechulin, Aiskaya ulitsa 77/2, kv. 24; Nikolai Semenovich Zonov, ulitsa Parkhomenko, 104, kv. 60; Leonid Kronidovich Prozorov, ulitsa Tsjurupy 84, kv. 239; Jury Maximovich Poskryakov, Revoljutsionnaya ulitsa 82, kv. 5; Grigory Grigorievich Kremennoi, ulitsa Festivalnaya 15, kv. 25, all of Ufa, and Vladimir Mikhailovich Goryachy, Komsomolskaya ulitsa 37a, kv. 29, Okha-na-Sakhaline, all of U.S.S.R.**

**Filed Nov. 7, 1973, Ser. No. 413,453**
**Int. Cl. H01h** *35/18, 36/02*
**U.S. Cl. 200—84 C** **2 Claims**



1. A liquid level signalling device controlling the level of liquid in a reservoir comprising: a housing having an upper and lower part separated by a non-magnetic partition and rigidly attached to said reservoir; a first magnet stationarily fixed in the lower part of said housing; a second magnet accomodated in the lower part of said housing beneath said first magnet and at a predetermined distance therefrom so as to be movable toward and away from said first magnet, said second magnet being movably positioned relative to the first magnet for continuous magnetic attraction therebetween so that the poles of said first magnet face the poles of the second magnet having opposite polarity; a float floatably co-operating with the level of liquid being controlled in the reservoir; a flexible link connecting said second magnet to said float to move therewith and relative to said first magnet according to movements of the level of the liquid in the reservoir; a magnetically driven contact mounted in the upper part of said housing in the stray magnetic flux field of said first magnet, said second magnet compensating for the action of the stray magnetic flux of said first magnet upon said magnetically driven contact whereby when the level of the liquid in the reservoir falls, the second magnet moves away from the first magnet and the stray flux of said first magnet in the vicinity of said contact increases to close said contact, and when the level of the liquid in the reservoir rises the stray flux of said first magnet in the vicinity of said contact decreases to thereby open said magnetically driven contact.

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## 3,896,282
## HIGH VOLTAGE CIRCUIT INTERRUPTING DEVICE

**Leonard Valentine Chabala, Maywood, Ill., assignor to S&C Electric Company, Chicago, Ill.**

**Filed May 25, 1973, Ser. No. 363,997**
**Int. Cl.² H01H** *33/70*
**U.S. Cl. 200—148 A** **21 Claims**

1. A high voltage electrical circuit interrupting device inter-

rupting current flow between a first portion of the circuit and a second portion of the circuit comprising:

a hollow sealed gas tight housing;

an arc quenching gas contained in said housing;

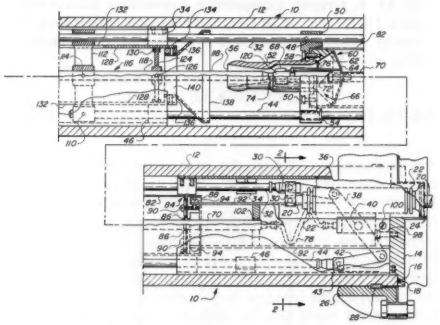
a first movable electrical contact connected to the first portion of the circuit mounted within the housing;

a second movable electrical contact connected to the second portion of the circuit within the housing normally engaging said first contact to complete the electrical circuit;

operating means including:

an operating rod extending through a wall of said housing;

a first pull rod connected to said first contact;



a second pull rod connected to said second contact;

a first mechanical linkage connecting said first pull rod and said operating rod so that movement of said operating rod causes movement of said first pull rod; and

second mechanical linkage connecting said first and said second pull rods so that movement of said first pull rod in one direction causes movement of said second pull rod in an opposite direction;

whereby movement of said operating rod produces movement of said first and second pull rods in opposite directions thereby causing said first and second contacts to move in opposite directions to interrupt the electrical circuit.

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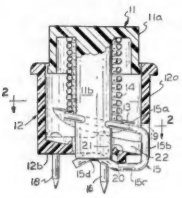
**3,896,283**

## TWO-STAGE PUSH BUTTON SWITCH

**Julian D. Hayden, Vancouver, Wash., assignor to Syndyne Corporation, Vancouver, Wash.**

**Filed Sept. 1, 1971, Ser. No. 176,870**
**Int. Cl. H01h *13/52***
**U.S. Cl. 200—159 R** **8 Claims**



1. A multiple stage push button switch comprising:

a push button,

a single spring resisting depression of the push button,

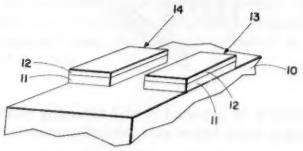
and means mounting said spring so that only a fraction of its resistive force resists depression of said button during one stage of operation, while a larger fraction resists depression during a second stage, and a still larger fraction is resisting depression during a third stage.

**3,896,284**

## THIN-FILM MICROELECTRONIC RESISTORS

**Edward S. B. Holmes, Almonte, Canada, assignor to Microsystems International Limited, Montreal, Canada**

**Continuation of Ser. No. 261,722, June 12, 1972, abandoned.**
**This application Mar. 11, 1974, Ser. No. 450,076**
**Int. Cl. H01c *13/00***
**U.S. Cl. 338—48** **2 Claims**



1. A multi-layer resistor assembly comprising a substrate member having two layers of electrically conductive material thereupon extending between terminal means for said resistor, the first layer, adjacent said substrate, being comprised of chromium, and the second layer, of decreased resistivity with respect to the first layer, being comprised of tantalum.

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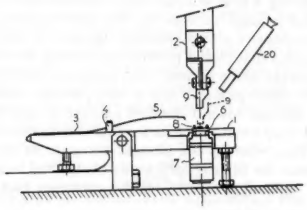
**3,896,285**

## PROCESS AND DEVICE FOR WELDING OF MULTIWIRE CABLES

**Raymond Louis Delorme, Bagnolet, France, assignor to Societe Honeywell Bull (Societe Anonyme), Paris, France**

**Filed May 16, 1973, Ser. No. 360,881**
**Int. Cl. B23k *11/00***
**U.S. Cl. 219—80** **8 Claims**

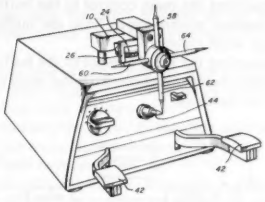


1. A welding device for use in welding plural wires of a multiwire flat cable of the type wherein the wires are arranged in predetermined evenly spaced insulated relation within an insulating sheath, to a printed circuit having conductive zones of a predetermined spacing corresponding to the spacing of the wires, said device comprising a welding head and a pedestal below said welding head, aid pedestal having first means for supporting a printed circuit including a slideway for slideably receiving a printed circuit, and second means on said pedestal defining a guide path for a multiwire flat cable, said second means including a pair of guide feed spaced transversely of said guide path and a cable holding spring extending longitudinally of said guide path and in elevated relation to said pedestal for holding a cable in an elevated position relative to said pedestal.

## 3,896,286
## ELECTRIC WELDING APPARATUS

**Christopher John Minors, 9 Southbourne Rd., Sheffield S10 2QN, England**

**Filed Sept. 25, 1973, Ser. No. 400,537**
**Claims priority, application United Kingdom, Sept. 26, 1972, 44320/72; Sept. 26, 1972, 44321/72**
**Int. Cl. B23k** *11/10*
**U.S. Cl. 219—86** **9 Claims**



**1.** An orthodontic welding machine comprising
1. a first electrode,
2. a turret support,
3. a turret rotatably mounted on the turret support,
4. a plurality of second electrodes radiating from the turret and disposed to permit any one of the second electrodes to be selectively brought into welding registration with the first electrode,
5. a push button located centrally of the rotatable turret,
6. locking and registration pin means connected to the push button,
7. turret locking spring means acting upon the locking and registration pin means and urging the locking and registration pin means into locking apertures in the turret support, whereby release of the turret is effected by pressing the push button against the action of the turret locking spring means to disengage the locking and registration pin means from the locking apertures, the turret and the second electrodes thereupon being enabled to rotate on the turret support to permit a selected second electrode to be brought into welding registration with the first electrode and whereby release of the push button causes reengagement of the locking and registration pin means in the locking apertures to retain the selected electrode in firm welding registration with the first electrode,
8. two spaced parallel pillars,
9. carrier means movably mounted on the pillars, the carrier means having the turret support mounted thereon,
10. welding spring means acting on the carrier means to urge the first electrode and turret together,
11. displacement means for moving the turret and first electrode apart against the action of the welding spring means, and
12. electrical power supply means for supplying electrical power to the first electrode and the second electrode which is locked in registration therewith to effect welding.

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## 3,896,287
## DIRECT CURRENT ARC POWER SUPPLY

**George E. Cook, Brentwood, Tenn., assignor to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed July 11, 1973, Ser. No. 378,265**
**Int. Cl. B23k** *9/10*
**U.S. Cl. 219—131 R** **22 Claims**

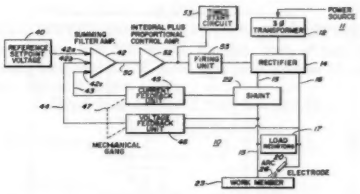
**1.** An arc power supply for controlling the volt-ampere characteristic of the direct current applied by way of lead means to a pair of electrodes which establishes and maintains an arc between said electrodes, comprising:

power means operable for providing through said lead means direct current to said electrodes,

reference setpoint means to produce a set reference signal related to a desired value of said direct current,

adjustable means connected to said lead means for sensing said arc current and providing an adjustable current feedback signal,

adjustable means connected to said lead means for sensing the voltage across said electrodes and providing an adjustable voltage feedback signal,



feedback control means coupled to said power means for summing said set reference signal, said adjustable current feedback signal and said adjustable voltage feedback signal for applying a control signal to said power means to control said volt-ampere characteristic, and

means for simultaneously adjusting both said adjustable current sensing means and said adjustable voltage sensing means to provide infinite and continuous control of said volt-ampere characteristic of said direct current between and including a constant current characteristic and a constant potential characteristic.

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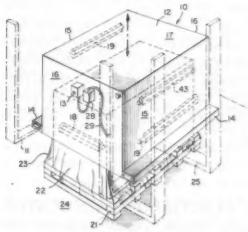
## 3,896,288
## METHOD OF HEAT-SHRINK WRAPPING GOODS

**Martin J. Tulkoff, 3404 Shelburne Rd., Baltimore, Md. 21208**

**Continuation-in-part of Ser. No. 254,548, May 18, 1972, Pat. No. 3,723,708. This application Mar. 26, 1973, Ser. No. 344,774**
**Int. Cl.[2] B65B** *53/02;* **H05B** *1/00*
**U.S. Cl. 53—30** **1 Claim**



**1.** A method of heat-shrink-wrapping goods with a heat-shrinkable film comprising the steps of:

a. covering said goods with said film to embrace and retain the goods in a desired condition when the film is shrunken therearound;

b. providing a wall-enclosed housing having one open wall to permit entrance of the goods;

c. placing said film-wrapped goods in alignment with said wall-enclosed housing;

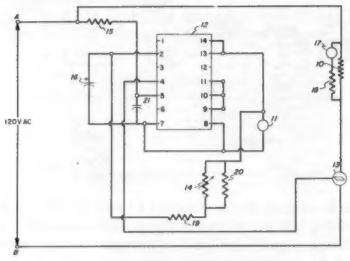
d. heating the air within said wall-enclosed housing to a heat-shrink temperature such that said air is maintained in a substantially quiescent state; and while said air is in said heated quiescent state;

e. imparting movement to at least one of said goods and wall-enclosed housing whereby said film-wrapped goods are esentially enclosed by said wall-enclosed housing.

## 3,896,289
## AQUARIUM WATER HEATER

Edmond F. Di Renna, 60 Lessing Rd., West Orange, N.J. 07052

Filed Nov. 13, 1974, Ser. No. 523,346
Int. Cl.[2] H05B 3/06
U.S. Cl. 219—523 2 Claims




1. An immersion-type electric aquarium heater comprising:
a. an electric heater element;
b. temperature sensing means located at a spaced point from said heater element and thermally insulated therefrom and comprising a negative temperature coefficient thermistor, the change in electrical resistance exhibited by said thermistor over the temperature range of about 72° to about 86°F. being substantially linear with respect to variations in temperature over said temperature range;
c. alternating current supply means for said heater element;
d. heater element control means electrically connected to said alternating current supply means, said heater element and said temperature sensing means and comprising (i) a zero voltage switch, (ii) a bi-directional thyristor and (iii) a multi-turn potentiometer, said temperature sensing means and potentiometer connected in series in a circuit that is adapted to provide a voltage V to said zero voltage switch, said zero voltage switch operable responsive to said voltage V and adapted to electrically actuate said thyristor, said thyristor adapted to permit or halt the flow of alternating current to said heater element; and
e. housing means formed of an electrical insulating material and adapted to receive said heater element and heater element control means and be positioned within an aquarium.

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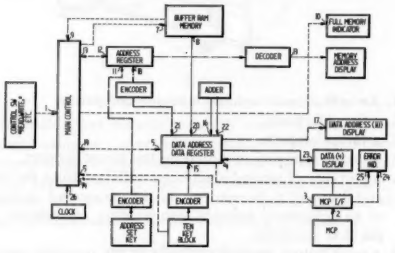
## 3,896,290
## ELECTRONIC CALCULATOR

Roger Denoual, Tokyo, Japan, assignor to Establissement Teltest R.D., Vaduz, Liechtenstein

Filed Jan. 30, 1974, Ser. No. 437,991
Claims priority, application France, Jan. 12, 1973, 73.01076
Int. Cl. G06k 7/00
U.S. Cl. 235—61.7 R 1 Claim

1. An electronic calculator for authenticating messages comprising:
a main control;
a control switch;
a clock;
an address register;
a first encoder;
a second encoder;
an address set key;
a buffer ram memory;
a data address-data register;
third encoder;
a key block;
an adder;
a decoder;
a full memory indicator;
a memory address display;
a data address display;
a data display
an error indicator;
a magnetic card printer interface;
a magnetic card printer;
means connecting the main control to the buffer ram memory for address transmissions from the buffer ram memory to the main control;
means connecting the main control to the buffer ram memory for address transmissions from the main control to the buffer ram memory;




means connecting the main control to the address register for control transmissions between the main control and the address register;
means connecting the main control to the full memory indicator for address transmissions from the main control to the full memory indicator;
means connecting the main control to the data address-data register for address transmissions between the main control and the data address-data register;
means connecting the main control to the magnetic card printer interface for address transmissions between the magnetic card printer interface to the main control;
means connecting the main control to the key block for address transmissions between the main control and the key block;
means connecting the main control to the address set key for address transmissions from the main control to the address set key;
means connecting the main control to the clock for address transmissions from the clock to the main control;
means connecting the main control to the control switch for address transmissions from the control switch to the main control;
means connecting the address register to the buffer ram memory for control transmissions from the address resister to the buffer ram memory;
means connecting the address register to the decoder for control transmissions from the address register to the decoder;
means connecting the address register to the first encoder for control transmissions from the first encoder to the address register;
means connecting the address register to the second encoder for control transmissions from the second encoder to the address register;
means connecting the first encoder to the data address-data register for control transmissions from the first encoder to the data address-data register;
means connecting the second encoder to the address set key for control transmissions from the second encoder to the address set key;
means connecting the buffer ram memory to the data ad-

dress-data register for data transmissions between the buffer ram memory and the data address-data register;
means connecting the data address-data register to the third encoder for control transmissions from the third encoder to the data address-data register;
means connecting the third encoder to the data address-data register for data transmissions between the third encoder and the data address-data register;
means connecting the third encoder to the key block for control transmissions from the key block to the third encoder;
means connecting the third encoder to the key block for data transmissions from the key block to the third encoder;
means connecting the adder to the data address-data register for control transmissions between the adder and the data address-data register;
means connecting the adder to the data address-data register for data transmissions between the adder and the data address-data register;
means connecting the data address-data register to the data address display for control transmissions from the data address-data register to the data address display;
means connecting the data address-data register to the data display for data transmissions from the data address-data register to the data display;
means connecting the data address-data register to the magnetic card printer interface for data transmissions between the data address-data register and the magnetic card printer interface;
means connecting the data address-data register to the error indicator for address transmissions from the data address-data register to the error indicator;
means connecting the decoder to the memory address display for control transmissions from the decoder to the memory address display;
means connecting the magnetic card printer interface to the error indicator for address transmissions from the magnetic card printer interface to the error indicator; and
means connecting the magnetic card printer interface to the magnetic card printer.

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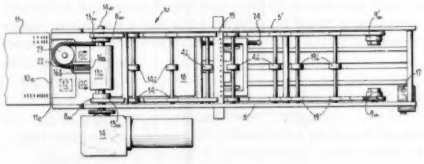
**3,896,291**

## CARD READER MECHANISM

**Charles W. Wiedeman, Castro Valley, Calif., assignor to The Singer Company, New York, N.Y.**

**Filed Feb. 14, 1974, Ser. No. 441,181**
**Int. Cl. G06k** *13/02, 7/10*
**U.S. Cl. 235—61.11 R** **12 Claims**



**1.** In a card reader for reading a punched card and having a planar transport channel and a read-out station, the combination comprising:

a. card transport means for transporting a punched card into and out of said card reader, wherein said card transport means includes means for grasping the longitudinal edges of a punched card in a yieldable fashion;

b. means for longitudinally aligning an inserted punched card to insure a proper vertical column alignment of each column across said read-out station, and wherein said means for longitudinally aligning a card includes a movable carriage having a flange-head for abutting the leading edge of an inwardly driven punched card, said flange-head precipitating slippage of the longitudinal edges of said incoming punched card when one portion of the leading edge of said punched card strikes said flange-head before the remainder of the leading edge does so, causing the correct alignment of said punched card in said planar transport channel;

c. means for triggering a strobe signal upon the correct placement of a vertical column of the punched card in said read-out station.

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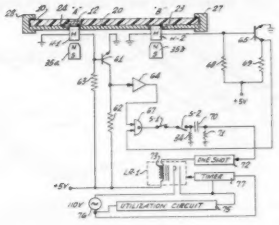
**3,896,292**

## HALL EFFECT POSITION CODED CARD DETECTOR

**Michael May, and Melvin M. English, both of Los Angeles, Calif., assignors to Michael May and Melvin M. English, both of Los Angeles, Calif.**

**Filed June 18, 1973, Ser. No. 371,063**
**Int. Cl.² G06K** *7/08*
**U.S. Cl. 235—61.11 D** **15 Claims**



**1.** In a Hall effect encoded card detector, the improvement comprising:

a. a transistor circuit having a two terminal magnetoresistor connected in a bias circuit thereof to control the state of conductivity of said transistor, said bias circuit being such that said transistor is rendered conductive at one resistance value of said magnetoresistor and is rendered nonconductive at another resistance value of said magnetoresistor;

b. means positioned to provide a magnetic bias field of fixed magnitude to said magnetoresistor;

c. encoded card receiving plate means having means to position said magnetoresistor adjacent a predetermined position on said plate means; and

d. said plate means further having means to position an encoded card with respect to said plate means so as to position a card encoding piece of unmagnetized but high permeability material embedded in said card adjacent said magnetoresistor predetermined position to thereby modify the bias field through said magnetoresistor and thus control the state of conductivity of said transistor responsively to the presence or absence of said piece of high permeability material in said card to indicate said presence or absence.

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**3,896,293**

## CARD READER TRANSPORT MECHANISM

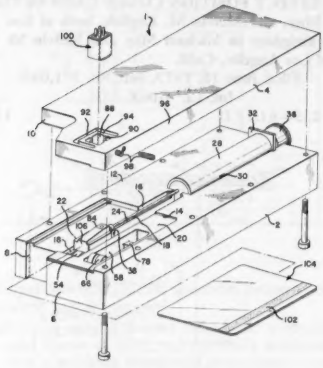
**Raymond Vincent Pass, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Aug. 6, 1973, Ser. No. 385,776**
**Int. Cl.² G06K** *13/04;* **B65H** *9/14;* **H01H** *61/00*
**U.S. Cl. 235—61.11 R** **4 Claims**

**1.** In a card reader transport mechanism, the combination comprising;

a base, a transducer mounted above said base and adapted to serially scan across an encoded portion of an encoded card which is transported past said transducer, wherein said transport mechanism is adapted to transport said card serially past said transducer, the improvement comprising:

an energy storing mechanism comprising a reeling device which is provided with a reeled strip capable of automatically rewinding in reeled configuration on said reeling device, said energy storing mechanism being responsive to the displacement of said card from a first position to a second position to store energy thereby, said displacement of said card from said first position to said second position creates unreeling of said strip from said reeling device, said energy storing mechanism expending the stored energy at a constant rate to rewind said strip and



thereby displace said card from said second position to said first position, thereby transporting said card serially past said transducer, and a throttling device coupled to said energy storing mechanism for controlling the rate at which the stored energy is expended so as to limit displacement of said card to a constant velocity past said transducer, said throttling device being in the form of a fluidic dash-pot opposing the automatically rewinding strip and thereby limiting the rate of rewinding of said strip to a constant rate.

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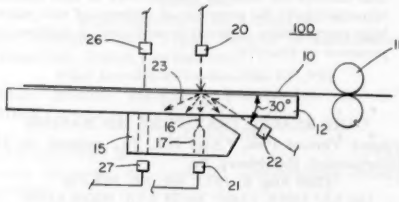
**3,896,294**

## PLURAL MODE CARD READING APPARATUS

**John C. Schisselbauer, Southampton, and James P. Jacobs, Phoenixville, both of Pa., assignors to Peripheral Dynamics, Inc., Norristown, Pa.**

**Filed Sept. 5, 1973, Ser. No. 394,547**
**Int. Cl.[2] G06K** *7/10, 7/14, 19/06*
**U.S. Cl. 235—61.11 E** **9 Claims**




**1.** Apparatus adapted for reading both data cards encoded in the transmissive mode and data cards encoded in the reflective mode, comprising:

a. transport means for transporting data cards through said apparatus;

b. transmissive light source means for transmitting light onto transmissive mode cards which are being transported through said transport means;

c. reflective light source means for transmitting light onto reflective mode cards which are being transported through said transport means;

d. detection and conversion means positioned

i. relative to said transmissive source means so as to detect light transmitted therefrom through transmissive mode cards which are being transported through said transport means and

ii. relative to said reflective source means so as to detect light transmitted therefrom and reflected from reflective mode cards which are being transported through said transport means, said detection and conversion means converting such detected light to electrical signals carrying information representative of the encoded information of said transported cards;

e. signal processing means for processing said electrical signals to provide digital signals representative of said encoded card information, said signal processing means having timing means synchronized.

i. in a first time relationship to the passage of said cards through said transport means for processing of transmissive mode cards and

ii. in a second time relationship to the passage of said cards through said transport means for processing of reflective mode cards; and

f. said signal processing means having column rate reading means adapted to read said cards according to a first column rate when in a first column mode and according to a second column rate when in a second column mode.

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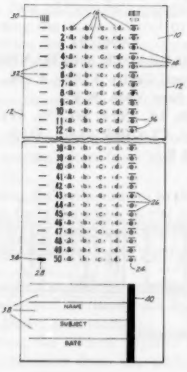
**3,896,295**

## DATA PROCESSING FORM

**Harold J. LaPlante, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed Aug. 2, 1974, Ser. No. 494,233**
**Int. Cl.[2] G06K** *19/06;* **G09B** *7/00*
**U.S. Cl. 235—61.12 N** **4 Claims**




**1.** A data processing form for use with photoelectric sensing apparatus of the type for sensing the presence of indicia in indicia receiving locations on the form, said form comprising

a. a generally rectangular shaped sheet of paper or like material having longitudinal and transverse axes, and at least one generally straight edge parallel with one of said axes, said straight edge providing a reference edge for guiding the movement of the paper through said sensing apparatus;

b. a series of indicia receiving locations indicated on said sheet of paper, with each location having a given number of positions in which an indicia can be placed, said given number of positions of each location being spaced to

form rows generally perpendicular to said straight edge of the sheet and said series of locations being spaced with each position of said given number of positions therein being aligned with similar positions of adjacent locations to form columns generally parallel with said straight edge of the sheet;

c. a first timing mark column containing a plurality of first timing marks aligned with one of the columns of indicia receiving positions, with one of the first timing marks preceding each indicia receiving location in sequence; and

d. a second timing mark column containing a plurality of second timing marks, spaced from the column of indicia receiving positions and aligned parallel with said straight edge of the sheet, with each second timing mark being approximately aligned with a corresponding row of indicia receiving positions perpendicular to said straight edge of the sheet and being positioned with respect to the first timing mark preceding said corresponding aligned row of indicia receiving positions so as to be sensed after completion of the sensing of said first timing mark.

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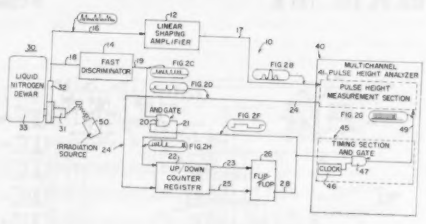
## 3,896,296
## LIVE TIME CORRECTION SYSTEM

Morris W. Barnhart, Buffalo Grove, Ill., assignor to Edax International Inc., Prarie View, Ill.

Filed Dec. 11, 1972, Ser. No. 313,777
Int. Cl. G06m 3/14
U.S. Cl. 235—92 EV 2 Claims




1. In a system including an analyzer for analyzing a stream of input data pulses from a pulse source wherein the analyzer requires a finite time period for the analysis of the input data pulses and provides an output pulse corresponding to the completion of each analysis, which finite time period overlaps in real time one or more adjacent input data pulses so that the analyzer provides an output pulse corresponding to only a portion of said input pulses and where the analyzer has a clock means providing a real time correlation input to said analyzer means, the improvement of an accurate live time correction circuit comprising:

a gate means,

an up/down counter register for counting pulses from zero up to a pre-set maximum count capacity,

said up/down register being connected to the pulse source through said gate means for counting up for each of the input data pulses from the pulse source and being connected to the analyzer for receiving and simultaneously counting down for each of the output pulses from the analyzer, so that the count normally in said register is the subtracted difference between the total count of the input data pulses from the pulse source and the total count of the output pulses from the analyzer,

and switch means operatively connecting said register to the clock means and also to said gate means,

said switch means being operative between a closed condition in response to said register reaching said pre-set maximum count capacity of said register and an opened condition in response to said register reaching zero,

said switch means, in said closed condition, switching off both the clock means input to the analyzer and said gate means for the time period extending between the time said pre-set maximum count capacity of said register is reached and the time said register is counted down to zero; whereby counts to said register corresponding to input data pulses are interrupted and said register is counted down to zero by the output pulses from said analyzer, and

the time periods in which said switch means is closed providing accurate time correction adjustment for the difference between the number of the input data pulses from the pulse source and the number of output pulses from the analyzer.

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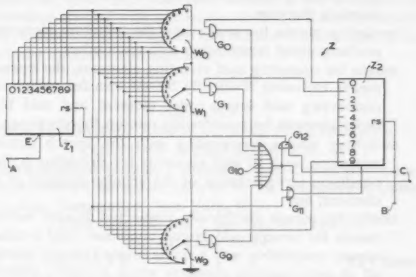
## 3,896,297
## ELECTRONIC COUNTER SYSTEM WITH VARIABLE COUNTING RANGES

Jurgen Ploppa, Postfach 73, Reutlingen, Germany

Filed May 18, 1973, Ser. No. 361,491
Claims priority, application Germany, May 18, 1972, 2234309
Int. Cl. H03k 21/36
U.S. Cl. 235—92 PD 3 Claims




1. In a flat knitting machine, an adjustable electronic counter system providing variable counting ranges for counting pattern repetitions, said counter system comprising a plurality of selector switches connected together in serial relationship, each said selector switch including a preselected plurality of sequential selector positions which constitute the counting range of that switch, a first decade counter which is connected to receive a signal related to the pattern count and which includes a plurality of outputs each of which is individually connected to a corresponding selector position of each of the selector switches, a plurality of AND gates each having a first input connected to the output of a corresponding selector switch, a further decade counter having a plurality of outputs, each said output of said further decade counter being individually connected to the second input of a corresponding AND gate, and an OR gate connected to the outputs of said AND gates and having an output connected to the counting input to said second decade counter, each said selector switch including an overrun position which is connected to ground and said counter system including means for interconnecting said selector switches and said decade counters such that when one of said selector switches is set to the overrun position, the corresponding AND gate is disabled and the next said selector switch is enabled so that the counting range of said next selector switch is added to that of said one selector switch.

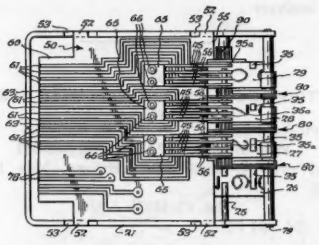
## 3,896,298
## COUNTING DEVICE

**Arthur W. Haydon, Middlebury, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.**

**Division of Ser. No. 197,343, Nov. 10, 1971, Pat. No. 3,787,663. This application July 6, 1973, Ser. No. 376,950The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.**

**Int. Cl. G06m** *1/276*

**U.S. Cl. 235—92 C** **15 Claims**



1. A counting device comprising, in combination:

a plurality of indicia bearing counting elements including a lower order element and a higher order element, each of said counting elements having switch actuating at spaced intervals thereon;

mounting means for supporting the counting elements in predetermined relationship with each other;

means for operating said counting elements, the operating means including resiliently biased transfer means interconnecting said lower order element and said higher order element for transferring motion therebetween;

switching means cooperating with the switch actuating means on each of said elements for providing a circuit condition representative of the angular position of each element; and

conductor means electrically connected to said switching means for sensing said circuit condition, said conductor means comprising only a single printed circuit board for all of said counting elements which is rigidly affixed to said mounting means to maintain the board in a single stationary position during both the operation of said counting elements and the sensing of said circuit condition.

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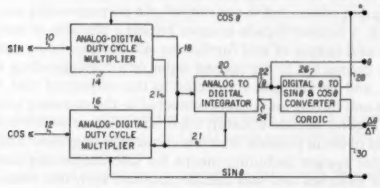
## 3,896,299
## TRIGONOMETRIC ANALOG-TO-DIGITAL CONVERSION APPARATUS

**Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed May 28, 1974, Ser. No. 474,119**

**Int. Cl.[2] G06G** *7/22;* **H03K** *13/02*

**U.S. Cl. 235—150.53** **7 Claims**




1. Conversion apparatus comprising, in combination:

first and second duty cycle multipliers, each including first and second signal inputs and a product output;

first and second means for supplying first and second analog signals indicative respectively of sine $\alpha$ and cosine $\alpha$ connected to said first signal inputs of respectively of said first and second multipliers;

conversion means, including input means and first and second outputs, for providing digital output signals at said first and second outputs thereof in response to digital signals supplied to said input means thereof, the output signals being indicative of cosine $\theta$ at said first output and sine $\theta$ at said second ouput when $\theta$ is applied to the input thereof;

means for connecting said first and second outputs of said conversion means to said second inputs of said first and second multipliers respectively; and

analog-to-digital integrating means connected between said outputs of said multipliers and said input of said conversion means for providing to said conversion means a digital signal $\theta$ obtained from integrating the difference of the product signals obtained from said multipliers.

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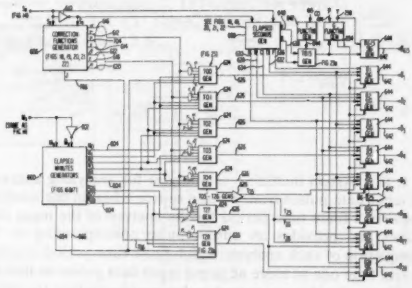
## 3,896,300
## AUTOMATIC ARTICLE SORTING AND PUNCHING MACHINE

**John W. Dillard; Dominick Tringali; Richard L. Swartz, and Ernest M. Hinson, Jr., all of Columbia, S.C., assignors to Universal Business Machines, Inc., Columbia, S.C.**

**Division of Ser. No. 135,656, April 20, 1971, Pat. No. 3,767,113. This application June 15, 1973, Ser. No. 370,530**

**Int. Cl. G06f** *11/00;* **G06k** *5/00*

**U.S. Cl. 235—153 R** **9 Claims**



1. An error checking and correction circuit for use with document control apparatus, the apparatus being responsive to at least two human readable recordings of time carried by a document to effect an operation on the document, one of the recordings being of values of greater significance than the other recording and the range of the recording of values of lesser significance includes at least all such values as are encompassed by at least one complete unit value of the most significant values, the circuit comprising:

first time signal generator means responsive at least in part to a digital signal which is representative of the recording having greatest value significance applied to inputs of the said means to generate a time signal unique to such value;

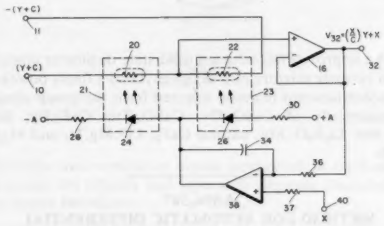
second time signal generator means responsive at least in part to a digital signal which is representative of the recording having lesser value significance to generate at least a first or second error checking and correction signal; and

comparator means responsive to said time signal and to said error checking and correction signal to provide a circuit output.

## 3,896,301
## SOLID STATE DC TIMES AC MULTIPLIER

Vincent A. Resta, Lauderdale Lakes, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 11, 1974, Ser. No. 432,731
Int. Cl.[2] G06G 7/16
U.S. Cl. 235—194 11 Claims




1. Means for multiplying a first quantity by a second quantity wherein at least said first quantity is represented by a first d.c. signal and said second quantity is represented by an a.c. signal + a D.C. reference and the a.c. signal + the D.C. reference inverted, comprising:

a voltage source;

a pair of light emitting means having a common junction point and connected in series across said voltage source;

a pair of light responsive resistive means having a common junction point and connected in series between said a.c. signal + a D.C. reference and said a.c. signal + a D.C. reference inverted;

an output terminal upon which an output signal related to the product of said first quantity and said second quantity is generated;

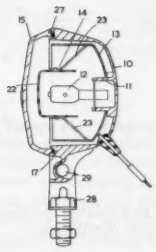
means for connecting the junction point of said pair of light responsive means to said output terminal; and,

first means responsive to the d.c. component of siad output signal and said first d.c. signal for generating a second signal related to the difference thereof, said pair of light emitting means being responsive to said second signal whereby the ratio of light emitted by said light emitting means with respect to one another is controlled, the ratio of the resistance of said light responsive resistive means with respect to one another being controlled by said ratio of light.

## 3,896,302
## AUTOMOTIVE SPOT LAMPS

George Joseph Whitney, Walsall, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 19, 1973, Ser. No. 407,841
Claims priority, application United Kingdom, Oct. 18, 1972, 49821/72
Int. Cl. F21m
U.S. Cl. 240—41 R 4 Claims




1. An electrical lamp comprising a body functioning as a housing for said lamp, said body having a recess therein; a bulbholder integral with said body; a reflector mounted in said body; a buld shield carried by said reflector; and a lens cover overlying said recess in said body.

## 3,896,303
## POLYEPOXIDE-CAPROLACTONE POLYOLS AND COATINGS BASED THEREON

Richard Michael Gerkin, Charleston, and Lowell Ray Comstock, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,791
Int. Cl. C08g 17/14
U.S. Cl. 260—78.3 R 12 Claims

1. A polyol composition prepared by the reaction of (a) a caprolactone polyol having an average of at least three hydroxyl groups per molecule and (b) a polyepoxide having at least two vicinal epoxy groups per molecule, said reactant (a) being employed in an amount at least sufficient to effect substantially complete reaction of the epoxy groups of (b).

## 3,896,304
## AUTOMATIC FOCUS ADJUSTMENT MEANS

Harumi Aoki, Tokyo, and Takuo Itagaki, Wako, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1973, Ser. No. 403,534
Claims priority, application Japan, Oct. 4, 1972, 47-99544
Int. Cl. G03b 3/00; G01j 1/20
U.S. Cl. 250—201 5 Claims

1.. Automatic focusing apparatus comprising:

focusing means, including a lens spaced from a plane, for forming an image on the plane, the lens and the plane being movable relative to each other in either of two opposite directions;

circuit means for generating trigger pulses;

a self-scan type photoelectric element disposed in the plane for linearly scanning the intensity distribution of the image, said photoelectric element having an input for receiving the trigger pulses, and an output on which, in response, it provides a time-varying electrical signal indicative of the degree of the intensity distribution; and

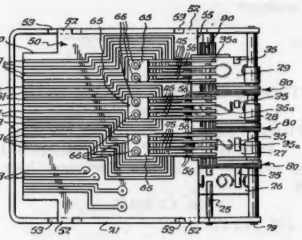
## 3,896,298
## COUNTING DEVICE

**Arthur W. Haydon, Middlebury, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.**

**Division of Ser. No. 197,343, Nov. 10, 1971, Pat. No. 3,787,663. This application July 6, 1973, Ser. No. 376,950The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.**

**Int. Cl. G06m** *1/276*

**U.S. Cl. 235—92 C** **15 Claims**



1. A counting device comprising, in combination:

a plurality of indicia bearing counting elements including a lower order element and a higher order element, each of said counting elements having switch actuating at spaced intervals thereon;

mounting means for supporting the counting elements in predetermined relationship with each other;

means for operating said counting elements, the operating means including resiliently biased transfer means interconnecting said lower order element and said higher order element for transferring motion therebetween;

switching means cooperating with the switch actuating means on each of said elements for providing a circuit condition representative of the angular position of each element; and

conductor means electrically connected to said switching means for sensing said circuit condition, said conductor means comprising only a single printed circuit board for all of said counting elements which is rigidly affixed to said mounting means to maintain the board in a single stationary position during both the operation of said counting elements and the sensing of said circuit condition.

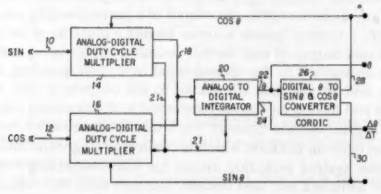
## 3,896,299
## TRIGONOMETRIC ANALOG-TO-DIGITAL CONVERSION APPARATUS

**Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed May 28, 1974, Ser. No. 474,119**

**Int. Cl.[2] G06G** *7/22;* **H03K** *13/02*

**U.S. Cl. 235—150.53** **7 Claims**




1. Conversion apparatus comprising, in combination:

first and second duty cycle multipliers, each including first and second signal inputs and a product output;

first and second means for supplying first and second analog signals indicative respectively of sine $\alpha$ and cosine $\alpha$ connected to said first signal inputs of respectively of said first and second multipliers;

conversion means, including input means and first and second outputs, for providing digital output signals at said first and second outputs thereof in response to digital signals supplied to said input means thereof, the output signals being indicative of cosine $\theta$ at said first output and sine $\theta$ at said second ouput when $\theta$ is applied to the input thereof;

means for connecting said first and second outputs of said conversion means to said second inputs of said first and second multipliers respectively; and

analog-to-digital integrating means connected between said outputs of said multipliers and said input of said conversion means for providing to said conversion means a digital signal $\theta$ obtained from integrating the difference of the product signals obtained from said multipliers.

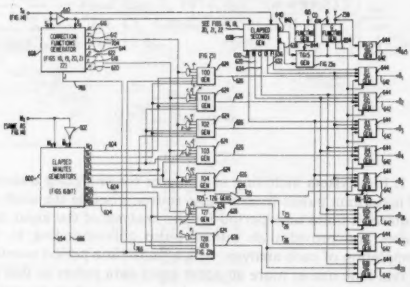
## 3,896,300
## AUTOMATIC ARTICLE SORTING AND PUNCHING MACHINE

**John W. Dillard; Dominick Tringali; Richard L. Swartz, and Ernest M. Hinson, Jr., all of Columbia, S.C., assignors to Universal Business Machines, Inc., Columbia, S.C.**

**Division of Ser. No. 135,656, April 20, 1971, Pat. No. 3,767,113. This application June 15, 1973, Ser. No. 370,530**

**Int. Cl. G06f** *11/00;* **G06k** *5/00*

**U.S. Cl. 235—153 R** **9 Claims**



1. An error checking and correction circuit for use with document control apparatus, the apparatus being responsive to at least two human readable recordings of time carried by a document to effect an operation on the document, one of the recordings being of values of greater significance than the other recording and the range of the recording of values of lesser significance includes at least all such values as are encompassed by at least one complete unit value of the most significant values, the circuit comprising:

first time signal generator means responsive at least in part to a digital signal which is representative of the recording having greatest value significance applied to inputs of the said means to generate a time signal unique to such value;

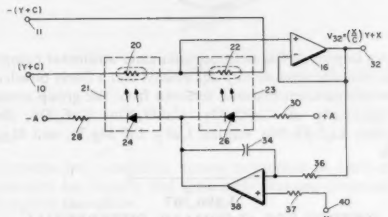
second time signal generator means responsive at least in part to a digital signal which is representative of the recording having lesser value significance to generate at least a first or second error checking and correction signal; and

comparator means responsive to said time signal and to said error checking and correction signal to provide a circuit output.

## 3,896,301
## SOLID STATE DC TIMES AC MULTIPLIER

Vincent A. Resta, Lauderdale Lakes, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 11, 1974, Ser. No. 432,731
Int. Cl.[2] G06G 7/16
U.S. Cl. 235—194 11 Claims




1. Means for multiplying a first quantity by a second quantity wherein at least said first quantity is represented by a first d.c. signal and said second quantity is represented by an a.c. signal + a D.C. reference and the a.c. signal + the D.C. reference inverted, comprising:

a voltage source;

a pair of light emitting means having a common junction point and connected in series across said voltage source; a pair of light responsive resistive means having a common junction point and connected in series between said a.c. signal + a D.C. reference and said a.c. signal + a D.C. reference inverted;

an output terminal upon which an output signal related to the product of said first quantity and said second quantity is generated;

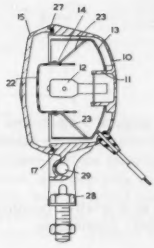
means for connecting the junction point of said pair of light responsive means to said output terminal; and,

first means responsive to the d.c. component of siad output signal and said first d.c. signal for generating a second signal related to the difference thereof, said pair of light emitting means being responsive to said second signal whereby the ratio of light emitted by said light emitting means with respect to one another is controlled, the ratio of the resistance of said light responsive resistive means with respect to one another being controlled by said ratio of light.

## 3,896,302
## AUTOMOTIVE SPOT LAMPS

George Joseph Whitney, Walsall, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Oct. 19, 1973, Ser. No. 407,841
Claims priority, application United Kingdom, Oct. 18, 1972, 49821/72
Int. Cl. F21m
U.S. Cl. 240—41 R 4 Claims




1. An electrical lamp comprising a body functioning as a housing for said lamp, said body having a recess therein; a bulbholder integral with said body; a reflector mounted in said body; a buld shield carried by said reflector; and a lens cover overlying said recess in said body.

## 3,896,303
## POLYEPOXIDE-CAPROLACTONE POLYOLS AND COATINGS BASED THEREON

Richard Michael Gerkin, Charleston, and Lowell Ray Comstock, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,791
Int. Cl. C08g 17/14
U.S. Cl. 260—78.3 R 12 Claims

1. A polyol composition prepared by the reaction of (a) a caprolactone polyol having an average of at least three hydroxyl groups per molecule and (b) a polyepoxide having at least two vicinal epoxy groups per molecule, said reactant (a) being employed in an amount at least sufficient to effect substantially complete reaction of the epoxy groups of (b).

## 3,896,304
## AUTOMATIC FOCUS ADJUSTMENT MEANS

Harumi Aoki, Tokyo, and Takuo Itagaki, Wako, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1973, Ser. No. 403,534
Claims priority, application Japan, Oct. 4, 1972, 47-99544
Int. Cl. G03b 3/00; G01j 1/20
U.S. Cl. 250—201 5 Claims

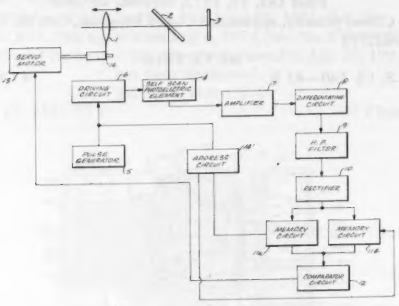
1.. Automatic focusing apparatus comprising:

focusing means, including a lens spaced from a plane, for forming an image on the plane, the lens and the plane being movable relative to each other in either of two opposite directions;

circuit means for generating trigger pulses;

a self-scan type photoelectric element disposed in the plane for linearly scanning the intensity distribution of the image, said photoelectric element having an input for receiving the trigger pulses, and an output on which, in response, it provides a time-varying electrical signal indicative of the degree of the intensity distribution; and

servomechanism means responsive to the time-varying electrical signal for adjusting the spacing between the lens




and the plane to a relative position that maximizes the degree of intensity distribution.

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**3,896,305**

**INTEGRATED OPTICAL DEVICE ASSOCIATING A WAVEGUIDE AND A PHOTODETECTOR AND FOR METHOD MANUFACTURING SUCH A DEVICE**

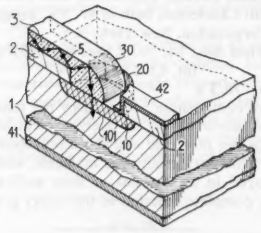
**Daniel Ostrowsky; Louis Marcel Reiber, and Raymond Poirier, all of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Apr. 16, 1974, Ser. No. 461,406**

**Claims priority, application France, Apr. 20, 1973, 73.14633**

**Int. Cl. G02b** *5/14*

**U.S. Cl. 250—227** **8 Claims**




**1.** An integrated optical device associating at least one optical waveguide for guiding a light wave with at least one photodetector for receiving at least part of said lightwave, and comprising :

a flat substrate of a semiconductor material having a given conductivity type and including upon one of its faces at least one region having a conductivity of the opposite type to that of the substrate, the junction between said region and said substrate forming said photodetector ;

a first dielectric layer arranged upon the same face of the substrate as said region, said first dielectric layer having a thickness at least equal to the wavelength of said light wave and including a window opposite said region;

a second dielectric layer, forming said waveguide, arranged at the surface of said first layer and at least partially covering said region within said window, said second dielectric layer having a thickness close to the wavelength of the said lightwave, being transparent to said lightwave and having a refractive index higher than that of the first layer.

**3,896,306**

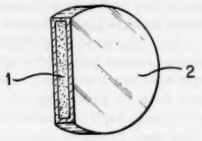
**FAST-NEUTRON SOLID-STATE DOSIMETER**

**Klaus H. Becker; Fred F. Haywood; Philip T. Perdue, and John H. Thorngate, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.**

**Filed June 20, 1974, Ser. No. 481,262**

**Int. Cl.[2] H05B** *33/00*; **G01T** *3/00*

**U.S. Cl. 250—392** **5 Claims**




**1.** An improved fast-neutron solid-state dosimeter comprising an intimate mixture of p-sexiphenyl and a finely powdered thermoluminescent material selected from the group consisting essentially of $CaSO_4$:Dy; $CaSO_4$:Tm; $CaF_2$:Dy; BeO; $CaF_2$:Mn; $Li_2B_4O_7$:Mn; natural $CaF_2$; LiF:Mg,Ti; and $Mg_2SiO_4$:Tb.

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**3,896,307**

**METHOD FOR AUTOMATIC DIFFERENTIAL LEUKOCYTE COUNT**

**Neil M. Trowe, Potomac, Md., assignor to Wheeler International Inc., Washington, D.C.**

**Filed Aug. 24, 1970, Ser. No. 66,560**

**Int. Cl. G01n** *33/16*

**U.S. Cl. 250—304** **3 Claims**

**1.** A method for making a differential count of leukocytes in blood which comprises the steps of:

a. preparing a dilute saline solution of the blood sample;

b. passing the dilute saline blood solution into a constricted chamber so that the individual cells are disposed in a single array;

c. subjecting the cells disposed in said constricted chamber in single file to sufficient ultraviolet radiation as the cells pass through the chamber to cause them to fluoresce;

d. segregating the fluorescent emissions from each cell according to the characteristic wavelength of the fluorescent emission of that type of cell;

e. registering the respective fluorescent emissions from each leukocyte cell according to its wavelength on a photomultiplier tube;

f. by means of counters recording the number of fluorescent emissions registered on the photomultiplier tubes from each type of leukocyte cell.

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**3,896,308**

**DETECTOR FOR ELECTRON MICROSCOPES**

**John Anthony Venables, Lewes; Peter John Pollard, Polegate, and Barrie William Griffiths, East Grinstead, all of England, assignors to National Research Development Corporation, London, England**

**Filed Jan. 7, 1974, Ser. No. 431,296**

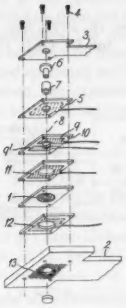
**Claims priority, application United Kingdom, Jan. 10, 1973, 1278/73**

**Int. Cl. H01j** *37/26*

**U.S. Cl. 250—305** **9 Claims**

**1.** A detector for an electron microscope and arranged to be mounted coaxially with regard to the electron beam of the electron microscope and adjacent a speciment to be analysed, the detector comprising a channel plate mounted between a pair of electrodes so that a potential can be applied across the channel plate, a grid of highly conductive material to control the field distribution in the specimen region and to select the

energies of the electrons reaching the channel plate and a pair of detector electrodes mounted so that the channel plate is located between a specimen to be analysed and said detector



electrodes and conductor means connected to each of said electrodes for directly and separately deriving electrical output signals therefrom.

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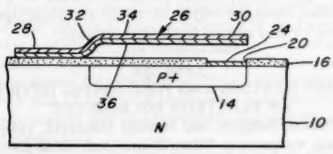
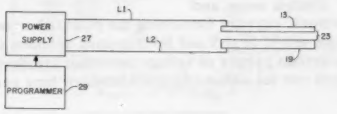
**3,896,309**
**RADIATION DETECTING DEVICE**
**Jack L. Halsor, Baltimore; Pieter Dewit, Ferndale, and Edgar L. Irwin, Glen Burnie, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**
**Filed May 21, 1973, Ser. No. 362,138**
**Int. Cl. H01l** *15/00*
**U.S. Cl. 250—211 J** **6 Claims**




1. A radiation detecting device for integrating incident radiation comprising a substrate of semiconductive material of one type conductivity, spaced regions of the other type conductivity formed in a surface of said substrate, an oxide layer covering at least selected portions of said surface of the substrate, a cantilevered member secured to said oxide layer at an area removed from said spaced regions and having a free end extending over the area of said substrate between said spaced regions, said cantilevered member being formed from at least two layers of different materials one above the other, the different materials having different coefficients of expansion, source and drain electrodes connected to said spaced regions, and a gate electrode connected to said cantilevered member, the arrangement being such that upon exposure to radiation and resulting heating of the cantilevered member, it will bend due to the different coefficients of expansion of said materials and vary the spacing between said cantilevered member and the substrate, whereby the surface conductivity characteristics of the substrate between the spaced regions can be made to vary as a function of the amount of radiation absorbed by the cantilevered member.

**3,896,310**
**FIELD CONTROL IN IMAGING SYSTEMS**
**Alex E. Jvirblis, and Walter Roth, both of La Jolla, Calif., assignors to Diagnostic Instruments, Inc., San Diego, Calif.**
**Continuation of Ser. No. 158,172, June 30, 1971, abandoned. This application Jan. 7, 1974, Ser. No. 431,020**
**Int. Cl. H01j** *37/26*
**U.S. Cl. 250—315** **15 Claims**




1. In a method of ionographic imaging including directing X-ray or gamma radiation toward an electrode of a first polarity having a photoemissive surface thereby to cause electrons to be emitted therefrom, and applying an electrical potential between said electrode and a second electrode of opposite polarity spaced therefrom, said emitted electrons causing charges to be deposited on an opposed insulative surface of said second electrode, said surfaces being spaced apart to define a gap, said depositing of charges forming retarding fields tending to reduce the electric field in the gap and retard the capture and deposit of additional charges on the insulative surfaces; the improvement which comprises increasing the potential applied between said electrodes as a function of incipient reduction of the average electric field in the gap as the charges are deposited on the insulative surface so as to maintain a substantially constant average electric field in said gap and thereby substantially completely compensate for the effect of the retarding fields.

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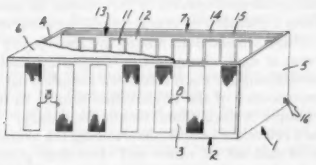
**3,896,311**
**PYROELECTRIC MOTION AND TEMPERATURE SENSITIVE INFRARED DETECTOR WITH CONDUCTIVE FINGERS**
**Allen L. Taylor, Woodbury, and Francis J. McFadden, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Jan. 2, 1974, Ser. No. 429,521**
**Int. Cl. G01t** *1/16*
**U.S. Cl. 250—342** **9 Claims**




1. An infrared motion and temperature sensitive detector for detecting a moving source of infrared radiation and comprising:

a front portion having a plurality of laterally spaced apart radiation transmissive apertures;

a back portion spaced from said front portion and formed of a multi-layer construction that includes:

inner and outer conductive layers, at least one of which is formed to provide one or more electrically connected sets of fingers that are substantially parallel to the apertures of said front portion, one of said conductive layers is electrically grounded, and said inner conductive layer has areas that are simultaneously exposed to and heated by radiation that emanates from said moving source and passes through the apertures of said

front portion and has other areas that are shielded from such radiation; and

a layer of poled, pyroelectric material interposed between and in surface-to-surface contact with such conductive layers and having areas that are heated by the heated areas of said inner conductive layer to result in the development of electrostatic charges on said heated pyroelectric areas and on at least one of said sets of conductive fingers in contact with said heated pyroelectric areas; and

electronic circuitry for sensing the potential on said one of said sets of fingers and for triggering an alarm only when a certain pattern of voltage potentials are developed on said one set within one predetermined time period.

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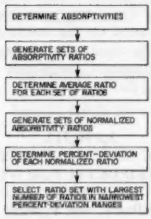
## 3,896,312
## PETROLEUM IDENTIFICATION

**Christopher W. Brown, R. R. 1, Box S-12, Saunderstown, R.I. 02874; Mark Ahmadjian, 10 Blackamore Ave., Cranston, R.I. 02910, and Patricia F. Lynch, 320 Boston Neck Rd., Narragansett, R.I. 02882**

**Filed June 7, 1974, Ser. No. 477,414**
**Int. Cl. G01n** *21/26*
**U.S. Cl. 250—343** **11 Claims**


DETERMINE ABSORPTIVITIES
GENERATE SETS OF ABSORPTIVITY RATIOS
DETERMINE AVERAGE RATIO FOR EACH SET OF RATIOS
GENERATE SETS OF NORMALIZED ABSORPTIVITY RATIOS
DETERMINE PERCENT-DEVIATION OF EACH NORMALIZED RATIO
SELECT RATIO SET WITH LARGEST NUMBER OF RATIOS IN NARROWEST PERCENT-DEVIATION RANGES

1. A method of comparing an unidentified oil sample to a set of reference oil samples which comprises the steps of:

a. preparing infrared spectra of the various oil samples;

b. selecting a plurality of characteristic frequencies in said infrared spectra and determining the absorptivity for each spectrum at each characteristic frequency, said absorptivities defining for each reference sample a set of ratios of absorptivities of the unidentified sample to the reference sample at each characteristic frequency;

c. for each reference sample, determining the average of the ratios in said set of ratios and thereafter generating a normalized ratio for each reference sample at each characteristic frequency by dividing each ratio in said set of ratios by said average ratio of the set;

d. for each reference sample and for each characteristic frequency thereof, determining the absolute value of the difference between said normalized ratio and 1.0 and multiplying that difference by 100 to generate a percent-deviation for each characteristic frequency of each reference sample;

e. establishing a plurality of percent-deviation ranges and determining for each set of normalized ratios the number of ratios having a percent-deviation falling within each of said percent-deviation ranges; and,

f. determining on the basis of the largest numerical quantity of characteristic frequencies falling within said percent-deviation ranges the reference sample which the unidentified sample most closely approximates.

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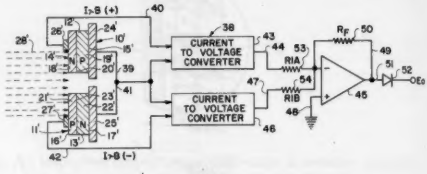
## 3,896,313
## PHOTODETECTOR APPARATUS WITH A ZERO CUT-OFF RESPONSE TO ABSOLUTE ZERO AT A SPECIFIED LIGHT FREQUENCY

**Herbert A. Berman, Lahaina, Hawaii; Robert B. Campbell, Pittsburgh, and Wallace D. Loftus, Clairton, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Jan. 16, 1974, Ser. No. 433,959**
**Int. Cl. G01t** *1/24*
**U.S. Cl. 250—372** **8 Claims**




6. An ultraviolet photodetector apparatus comprising:

A. at least first and second light sensor means each comprised of a silicon carbide semiconductor body having a PN junction therein, said first sensor means capable of producing electrical signals responsive to electromagnetic radiation of a first frequency range and producing a peak electrical response at a first peak ultraviolet frequency, and said second sensor means capable of producing electrical signals responsive to electromagnetic radiation of a second frequency range and producing a peak electrical response at a second peak ultraviolet frequency, said first and second frequency ranges being overlapping and said first and second peak ultraviolet frequencies being different; and

B. an electrical means for electrically comparing the electrical signals from at least said first and second light sensor means and producing an electrical signal of only one polarity and equal to a product of a first constant times the amplitude of the electrical signal produced by said first light sensor means minus a product of a second constant times the amplitude of the electrical signal produced by said second light sensor means.

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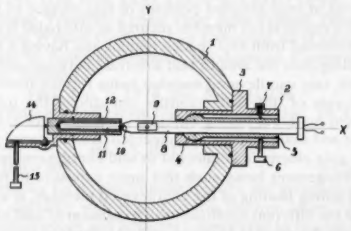
## 3,896,314
## SPECIMEN HEATING AND POSITIONING DEVICE FOR AN ELECTRON MICROSCOPE

**Shigeru Nukui, Saitama, and Hideaki Mikazuki, Tokyo, both of Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 5, 1973, Ser. No. 421,978**
**Claims priority, application Japan, Dec. 14, 1972, 47-143726**
**Int. Cl. H01j** *37/20*
**U.S. Cl. 250—442** **4 Claims**




1. A specimen heating and positioning device for an electron microscope or the like having an electron optical axis comprising a specimen stage adjustably fixed for positioning

a specimen along the optical axis, said stage arranged to expand on heating on an axis passing through the optical axis away from a first reference point fixed relative to the optical axis and spaced therefrom, a specimen holder mounted in said specimen stage for holding the specimen and arranged to expand on heating along the same axis along which the specimen stage expands in a direction away from a second reference point fixed relative to the specimen stage and on the opposite side of the optical axis from the first reference point, means for heating the specimen, the distances between the reference points and the optical axis being selected such that as the specimen holder and specimen are heated, incidental to the heating of the specimen, the expansion of the stage and holder are approximately equal thus maintaining the specimen substantially at the optical axis.

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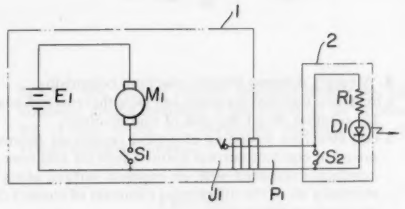
**3,896,315**

## REMOTE CONTROL UNIT WITH DISPLAY DEVICE

**Toshikazu Ichiyanagi, Tokyo, and Mitsutoshi Ogiso, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Japan**

**Filed Aug. 10, 1973, Ser. No. 387,312**
**Claims priority, application Japan, Aug. 16, 1972, 47-82003**
**Int. Cl. H01h** *47/00*
**U.S. Cl. 307—112** **8 Claims**




1. In a camera system having a camera and a detachable remote control unit, said camera including a driving motor, the improvement comprising:
   a first pair of electrical connectors mounted on the body of the camera and connected in series with said motor;
   a source of electrical energy mounted in said camera for driving said motor, said source being connected with said motor and at least one of said first pair of connectors, said energy source forming a drive circuit with said motor;
   a second pair of electrical connectors associated with said remote control unit and detachably connectable with said first connectors;
   light emitting indicating means associated with said remote control unit being responsive to current flow; and
   switching means associated with said remote control unit and connected to at least one of said second pair of connectors for actuating said motor drive circuit and for causing change of current flow through said indicating means for changing the condition of said indicating means.

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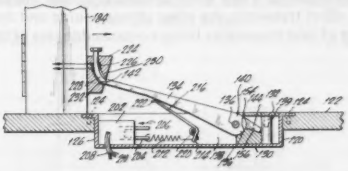
**3,896,316**

## ENTRY CONTROL DEVICE

**Salomon Serrano, 684-222nd St., Bronx, N.Y. 10467**

**Filed Jan. 25, 1974, Ser. No. 436,617**
**Int. Cl. G08b** *13/08*
**U.S. Cl. 307—149** **7 Claims**

1. An entry control device comprising a housing having end walls and opposed side walls, a base and a partial top, said base and partial top being connected to said end walls and side walls, a substantially rectangular stop plate having a first end pivotally mounted to shaft means within said housing and a second opposed end rotatable about said shaft to raised and closed positions, said stop plates being essentially aligned with the plane of said partial top, finger means attached to said first end of said stop plate, stop means connected to said base and positioned to engage said finger means when said stop plate is pivoted to open position, second pivotable means within said housing for urging said stop plate to raised and closed positions, electrical means within said housing for actuating said



second pivotable means, said electrical means being disposed on said base within said housing and providing support means for said second end of said stop plate when in closed position, and circuit connecting means for connecting said electrical means to a source of electric power.

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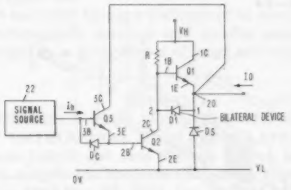
**3,896,317**

## INTEGRATED MONOLITHIC SWITCH FOR HIGH VOLTAGE APPLICATIONS

**Charles Noble Alcorn; Robert Joseph De Filippi, both of Reston; John David Henke, and Robert Ng Liang, both of Manassas, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 28, 1973, Ser. No. 429,307**
**Int. Cl. H03k** *17/00*
**U.S. Cl. 307—254** **10 Claims**




1. A voltage switch comprising
   a. first and second voltage supplies,
   b. an output terminal,
   c. an input amplifier connected to the output terminal and responsive to first and second input signals, and
   d. a power output switch connected to the output terminal and to the input amplifier
   e. whereby the first input signal causes the output terminal to follow the first voltage supply
   f. and the second input signal causes the output terminal to follow the second voltage supply and the input amplifier to lower the output impedance between the output terminal and the second voltage supply.

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**3,896,318**

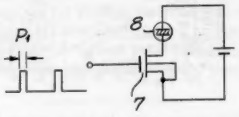
## DRIVING DEVICE FOR LIQUID CRYSTAL CELL

**Hiromitsu Mitsui, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 298,678, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 99,402, Dec. 18, 1970, abandoned. This application Dec. 20, 1973, Ser. No. 426,785**
**Claims priority, application Japan, Dec. 25, 1969, 44-103751**
**Int. Cl. G02f** *1/28, 3/16*
**U.S. Cl. 307—304** **1 Claim**

1. A display device comprising liquid crystal cell means having an impedance of 100 meg-ohms or greater and at least

two electrodes, said cell means being responsive to an electric field produced upon the application of a voltage to said electrodes; a direct-current power source having a pair of terminals; a source of an input signal formed from repetitive pulses; and an insulated gate field effect transistor for driving said cell means, one of said cell means electrodes being connected to one of the source and drain electrode of said insulated gate field effect transistor, the other of said source and drain electrodes of said transmitter being connected to one of the terminals of said power source, the other terminal of said power source being connected to the other electrode of said cell means, said input signal being applied to the gate electrode of said insulated gate field effect transistor wherein the pulse frequency of said pulse input signal is between 30 and 500 Hz and a duty cycle of one-third to one-eighth to permit the application of a driving pulse to said cell means of increased width relative to the pulse width of said input signal due to the input capacitance of said cell means and said transistor.

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**3,896,319**

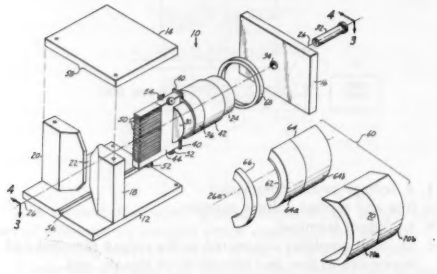
**LINEAR MOTOR**

**Srinivasan V. Chari, Foster City, Calif., assignor to Control Data Corporation, Minneapolis, Minn.**

**Filed Apr. 17, 1974, Ser. No. 461,565**

**Int. Cl.[2] H02K** *33/18*

**U.S. Cl. 310—14** **4 Claims**



1. A linear motor or the like comprising a housing; substantially cylindrical core means supported by said housing and having an axis, said core means having a first slot extending diametrically through said core means along a portion of the length of said core means from one end thereof; substantially cylindrical magnet means supported by said housing in substantially coaxial relation with said core means and substantially surrounding said core means, said magnet having its opposite poles radially aligned so that one pole portion is closer to said axis than the other pole portion, said magnet means having a second slot extending diametrically through said magnet means, said second slot being radially aligned with said first slot; substantially rectangular armature means at least partially supported by said housing for reciprocable movement along said axis; and coil means fixedly mounted to an end portion of said armature means and positioned between said core means and said magnet means, said end portion of said armature means being positioned in said first slot, whereby a magnetic circuit is formed between said core means, said magnet means, said coil means and a portion of said housing and is so disposed and arranged as to exclude said first and second slots so that magnetic flux is induced in said coil means without significantly inducing flux into said armature means.

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**3,896,320**

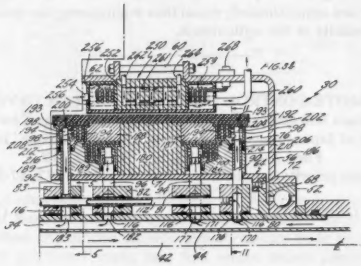
**HIGH SPEED ELECTRIC GENERATOR**

**E. Marston Moffatt, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed Oct. 19, 1971, Ser. No. 190,509**

**Int. Cl.[2] H02K** *1/32*

**U.S. Cl. 310—64** **6 Claims**



1. A rotary dynamo-electric machine comprising:

a magnetic core having poles and slots thereon and adapted for rotation about the axis of said machine;

a coil structure including electrical conductor means disposed to conduct current about a pole on said core, said conductor disposed with an exposed surface along substantially all of the differential elements of current carrying portions thereof;

means disposed along the axis of said machine for providing a source of coolant fluid under pressure; and

a pair of radial electrical conductor means extending from said fluid source radially outward to said coil structure, each of said conducting means being hollow and adapted to flow coolant fluid from said source to the exposed surfaces of said coil at one end thereof and from the other end of said coil structure back to said source, each conducting means electrically connected to one end of said coil.

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**3,896,321**

**SYSTEM FOR SUSPENDING A COLOR SELECTION ELECTRODE IN A COLOR CATHODE RAY TUBE**

**Stanley J. Sedivy, Chicago Ridge, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.**

**Filed Dec. 12, 1973, Ser. No. 424,017**

**Int. Cl. H01j** *29/06, 29/08, 31/20*

**U.S. Cl. 313—404** **14 Claims**

1. For use in a rectangular-type color cathode ray tube, a system for suspending a generally rectangular color selection electrode having a pattern of electron-transmissive apertures on the envelope of the tube at a predetermined precise spacing from a faceplate portion of the envelope bearing a corresponding pattern of red-emissive, blue-emissive and green-emissive phosphor element triads, including four electrode suspension devices spaced around the electrode, one at each corner thereof, each device comprising:

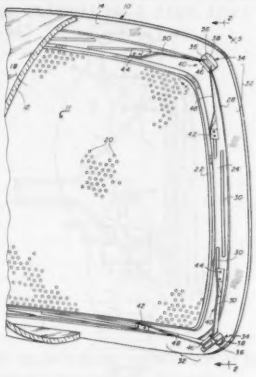
envelope-mounted means secured in a corner location on the inside of the envelope for supporting a corner of a color selection electrode; and

electrode-mounted means for retentively engaging said envelope-mounted means, comprising:

a bracket having an intermediate portion externally surrounding and embracing a corner of the electrode and

end portions secured to adjoining sides of the electrode, and

coupling means including a folded-back leaf spring having one leg secured to said intermediate portion of said



bracket and arching radially inwardly therefrom, said coupling means including a provision on an opposed leg of said spring for retentively engaging said envelope-mounted means.

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**3,896,322**

## SPARK PLUG OPERABLE WITH A FLOATING ARC

**Daisaku Sawada, and Yuji Takeda, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Jan. 28, 1974, Ser. No. 436,840**

**Claims priority, application Japan, Sept. 25, 1973, 48-111637**

**Int. Cl. H01t** *13/20*

**U.S. Cl. 313—142** **12 Claims**

**1.** A spark plug comprising electrodes disposed adjacent to each other, said electrodes defining a spark gap therebetween, a flow regulating means axially confronting the spark gap for regulating the flow direction of a fuel-air mixture to the spark gap for traversing the spark gap, said spark gap being narrowest at a region located upstream of said flow and extending along the flow of the fuel-air mixture.

**3,896,323**

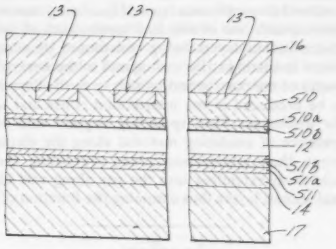
## GASEOUS DISCHARGE DEVICE HAVING LOWER OPERATING VOLTAGES OF INCREASED UNIFORMITY

**Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Continuation-in-part of Ser. No. 70,523, Sept. 8, 1970, abandoned. This application Sept. 20, 1973, Ser. No. 399,041**

**Int. Cl. H01j** *61/35*

**U.S. Cl. 313—188** **4 Claims**




**1.** In a gaseous discharge panel comprising a chamber formed by a pair of opposed walls and being sealed to contain an ionizable gaseous medium therein, said opposed walls including dielectric material charge storage surfaces on the gaseous side of each wall and being backed by electrode members, the improvement comprising:

a. a first contiguous layer of at least one oxide of Al, Ti, Zr, Hf, or Si, disposed on each dielectric surface,

b. a second contiguous layer of lead oxide disposed on said first layer, and

c. each said layer having a thickness of an amount sufficient to substantially decrease and stabilize panel operating voltages for a given period of panel operating time.

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**3,896,324**

## GAS-DISCHARGE DISPLAY PANEL WITH MATRIX OF ORTHOGONAL INSULATING LAYERS

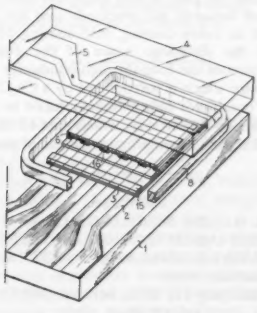
**Jean Pierre Galves, and Jean Philippe Reboul, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Dec. 27, 1971, Ser. No. 211,920**

**Claims priority, application France, Dec. 30, 1970, 70.47285**

**Int. Cl. H01j** *61/10*

**U.S. Cl. 313—190** **3 Claims**



**1.** A gas discharge display panel comprising:

a. two insulating slabs, at least one of which is transparent, said two slabs being sealed at their periphery by a sealing ring and defining in assembly parallel pairs of inner and outer surfaces;

b. an ionizable gas contained between the slabs inside said ring;
c. a network of conducting electrodes disposed on each of the inner surfaces of said slabs, the two networks being crossed in such a way that the application of suitable voltages between two electrodes respectively of each network produces a gaseous discharge in the intersection zones of these electrodes;
d. a first continuous layer of insulating material covering each of the two networks; and
e. a second discontinuous layer of insulating material deposited on each one of said first layers, each of said second discontinuous layers being constituted by a network of raised insulating strips orthogonal to the network of electrodes of the corresponding slab so as to allow discharges to be produced in the intersection zones and to prevent the discharges from spreading beyond said zones, the presence of insulating material along the electrodes between their intersection zones preventing the electric field from extending into the gas along said electrodes, said second layers thus assuming the function of a matrix.

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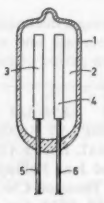
**3,896,325**

## DISCHARGE TUBE CONTAINING MERCURY

**Henricus Gerardus Antonius Willems, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 20, 1973, Ser. No. 390,167**
**Claims priority, application Netherlands, Sept. 12, 1972, 7212337**
**Int. Cl. H01j** *61/06*
**U.S. Cl. 313—218** **3 Claims**




1. A discharge tube having a wall of glass, which tube contains at least mercury and is furthermore provided with an internal electrode which is connected to an electrical lead-through conductor consisting mainly of copper-clad wire, and in which at least the part of said electrical lead-through conductor located between the electrode and the glass wall is provided with an oxide coating, said coating being in direct contact with the discharge space of the discharge tube, wherein said part of the lead-through conductor consists of a copper-clad wire which is surrounded by a $Cu_2O$ coating, the lead-through conductor being manufactured in known manner from a copper-clad wire of which part of the copper has been oxidised during heating by an electrical process.

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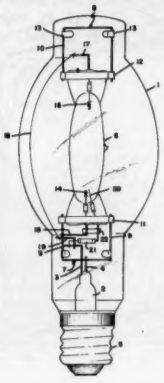
**3,896,326**

## METAL HALIDE DISCHARGE LAMP HAVING EXPANDED SECTION ARC TUBE

**Timothy Fohl, Carlisle, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.**

**Filed July 19, 1973, Ser. No. 380,737**
**Int. Cl. H01j** *17/16*
**U.S. Cl. 313—220** **2 Claims**

1. A general illumination wall stabilized metal halide arc discharge lamp comprising: an outer envelope; a generally tubular arc tube, having electrodes at each end, disposed within said envelope, said arc tube containing a fill including mercury, metal halide and an inert gas, the diameter of said arc tube being at a minimum at about the electrode regions thereof and gradually increasing therefrom to a maximum diameter at about the center of said arc tube; and means to energize said arc tube.



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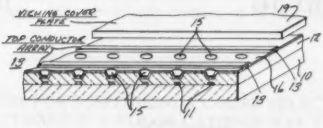
**3,896,327**

## MONOLITHIC GAS DISCHARGE DISPLAY DEVICE

**Jerry D. Schermerhorn, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Continuation-in-part of Ser. No. 239,015, March 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 197,003, Nov. 9, 1971, Pat. No. 3,787,106. This application Nov. 19, 1973, Ser. No. 416,727**
**Int. Cl. H01j** *11/02, 61/30*
**U.S. Cl. 313—220** **7 Claims**

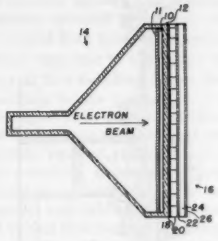



1. A monolithic gas discharge display/memory device which comprises:
a dielectric member having a selected thickness;
a cover plate member for maintaining an inert ionizable gaseous medium on one side of the dielectric member;
a first array of electrodes on the surface of the gas side of the dielectric member;
a second array of electrodes on the surface of the opposite non-gas side of the dielectric member, the electrodes in the arrays defining cooperating pairs of electrodes;
electrical circuit means for applying a potential to the electrodes to cause a gas discharge at each cooperating pair of electrodes;
and a plurality of structural formations in said one side of the dielectric member forming gas-filled cavities in the gas side of the dielectric member, one cavity forming structural formation juxtaposed adjacent to each cooperating pair of electrodes, respectively, so as to isolate each gas discharge relative to other gas discharges and increase the resolution of the device.

## 3,896,328
## DUAL MODE CRT SCREEN

Roy F. Potter, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,987
Int. Cl.[2] H01J 29/18, 31/20, 31/12
U.S. Cl. 313—463 2 Claims




1. A multiple mode cathode ray tube screen for presenting a display of differing persistence comprising:

a. an envelope having a viewing area with a screen supporting surface related thereto;

b. a dual phosphor screen formed on the inside of said supporting surface, said dual phosphor screen being composed of a first phosphor material responsive to optical and cathode ray excitation and exhibiting a phosphorescence of substantially short persistence in the visible spectrum and a second phosphor material responsive to optical and cathode ray excitation and exhibiting a phosphorescence in the non-visible spectrum, said dual phosphor material being approximately 50% phosphor emitting in the ultraviolet, having medium or long persistence, and approximately 50% short persistence green phosphor, and said photoconductive material being ultraviolet sensitive;

c. a photoconductive material whose resistance becomes negligible in response to excitation by photons from said non-visible phosphorescence;

d. a first transparent electrode layered between the outside surface of said face plate and said photoconductive material;

e. an electroluminescent material responsive to excitation by the presence of an electric field;

f. a second transparent electrode layered between said photoconductive material and said electroluminescent material;

g. a third transparent electrode layered on the outside surface of said electroluminescent material whereby a voltage may be established across said first and third electrodes that portion of said electro-luminescent material as said phosphor screen is scanned by the electron beam of said cathode ray tube.

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## 3,896,329
## PERMANENT MAGNET BEAM FOCUS STRUCTURE FOR LINEAR BEAM TUBES

Erling L. Lien, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Sept. 21, 1972, Ser. No. 291,117
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 7 Claims

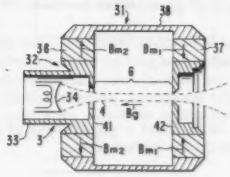
1. In a linear beam tube:

electron gun means for forming and projecting a beam of electrons over an elongated beam path;

collector means at the terminal end of the beam path for collecting and dissipating the energy of the collected electrons;

electrical circuit means disposed along the beam path intermediate said cathode means and said collector means in energy exchanging relation with the beam to produce an output signal;

magnet means for magnetically focusing the beam over said beam path between said electron gun means and said collector means, said magnet means including, electron gun and collector pole piece structures coaxially disposed of the beam path in axially spaced relation, said pole piece structures each being centrally apertured for passage of the beam therethrough and each being made of a magnetically permeable material, magnetically permeable magnetic yoke means coaxially disposed of said beam path and including axially spaced portions surrounding




said electron gun and collector pole piece structures respectively in radially spaced relation therefrom, permanent magnet means for energizing said pole piece structures, said permanent magnet means comprising essentially only first and second axially spaced centrally apertured radially polarized permanent magnet means of opposite radial polarity interposed between said respective pole piece structures and said respective surrounding yoke portions for producing an axially directed beam focus magnetic field within the beam path and extending axially between said pair of axially spaced electron gun and collector pole piece structures, the magnetic field within said permanent magnet means being composed of flux lines which are substantially radially directed and centered substantially at the beam axis.

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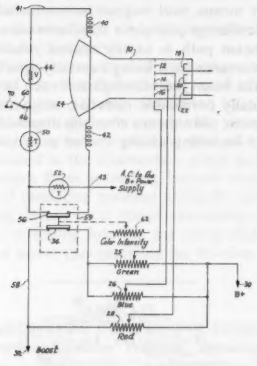
## 3,896,330
## COLOR TELEVISION DEGAUSSING CIRCUIT

Richard Travers Chamberlain, Arlington Heights, Ill., assignor to Admiral Corporation, Chicago, Ill.

Filed Sept. 28, 1970, Ser. No. 76,022
Int. Cl. H01j 31/20; H01f 13/00; H01j 29/98
U.S. Cl. 315—8 6 Claims

1. In a color television receiver having a picture tube susceptible to the effect of external magnetic fields, an electric circuit comprising: degaussing means positioned adjacent to the picture tube for degaussing the same, means for connecting the degaussing means to a power supply, circuit means connected to the degaussing means for causing a relatively large current to be passed from the power supply through the degaussing means for the time interval needed to degauss the picture tube, display circuit means for controlling the color of the field displayed on the picture tube, manual means for triggering operation of the degaussing circuit means to initiate a degaussing action, and said manual means substantially

simultaneously with the triggering function also producing a change in the normal operation of the display circuit means of



such character as to cause a visual effect of the degaussing action to appear on the picture tube.

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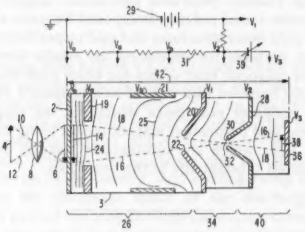
**3,896,331**

## ELECTRON OPTICAL SYSTEM

**Richard S. Enck, Jr., Mountain View, and James P. Sackinger, San Jose, both of Calif., assignors to Varian Associates, Palo Alto, Calif.**

**Filed June 28, 1973, Ser. No. 374,440**
**Int. Cl. H01j** *29/70*
**U.S. Cl. 315—17** **11 Claims**



1. An electron optical system comprising: image input means for providing a source of charged particles corresponding to an image, said means having a charged particle output surface maintained at a first potential;

a first electrode having an aperture and maintained at a second potential greater than said first potential, whereby the particles are accelerated from the particle output surface toward the first electrode and through the aperture thereof;

a second electrode having an aperture and located downstream from said first electrode, said second electrode being maintained at a third voltage less than said second voltage and being so shaped, dimensioned and positioned as to cause convergence of said charged particles and focussing thereof in a region adjacent said aperture in said second electrode; and

image output means having a surface downstream from said second electrode on which the particles form an image.

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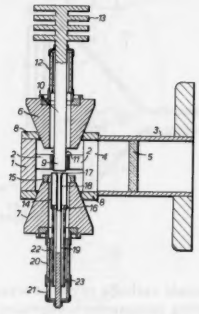
**3,896,332**

## HIGH POWER QUICK STARTING MAGNETRON

**Vincent Albert Heathcote, London, England, assignor to The M-O Valve Company Limited, London, England**

**Filed May 29, 1974, Ser. No. 474,240**
**Claims priority, application United Kingdom, June 4, 1973, 26552/73**
**Int. Cl.² H01J** *25/50*
**U.S. Cl. 315—39.51** **9 Claims**



1. A magnetron comprising: a secondary electron emissive main cathode; an anode resonator which defines a cylindrical space in which said main cathode is disposed so as to provide an annular space between the anode and cathode; an electron gun employing a thermionic cathode of low thermal inertia disposed at a position outside said cylindrical space defined by the anode and arranged to direct a stream of electrons into said annular space between the anode and said main cathode to initiate operation of the magnetron, whereafter at least the major part of the electron current required for operation of the magnetron is provided by said main cathode due to electron back bombardment; said thermionic cathode being sufficiently remote from said cylindrical space to not be subjected to significant electron back bombardment.

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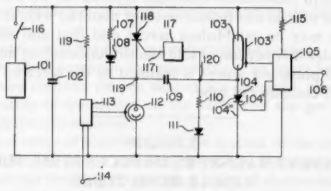
**3,896,333**

## ELECTRONIC FLASH DEVICE

**Zenzo Nakamura, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Japan**

**Filed May 9, 1973, Ser. No. 358,522**
**Claims priority, application Japan, May 10, 1972, 47-46129**
**Int. Cl. H05b** *37/02*
**U.S. Cl. 315—151** **3 Claims**



1. An electronic flash device for a photographic camera, operable to control the amount of light emitted by a flash tube by interrupting the discharge of a flash tube after initiation of the discharge thereof, said electronic flash device comprising, in combination, a source of electric potential; a first capacitor connected across said source for charging thereby; a flash tube having one terminal connected to one terminal of said first capacitor; a first switching means connected in series to the other terminal of said flash tube, at a junction point, and to the other terminal of said first capacitor, and operable to

effectively connect and disconnect said flash tube from said first capacitor; trigger means connected to said first switching means and operable to trigger said first switching means conductive for discharging said first capacitor through said flash tube; impedance means; a second capacitor; said impedance means connecting one end of said second capacitor with one terminal of said source of electric potential; the other end of said second capacitor being connected to said junction point of said first switching means and said flash tube, and to the other terminal of said source of electric potential, for charging of said second capacitor through said impedance means; signal generating means operable to generate a signal for interrupting flashing of said flash tube; first means connecting one end of said second capacitor to a terminal of said source of potential and to said first switching means, and connected to said signal generating means for operation responsive to a flash interrupting signal to be conductive for a predetermined time by the flash interrupting signal so as to reverse the potentials at the opposite ends of said second capacitor and to trigger said first switching means non-conductive; whereby said second capacitor is discharged; and a second means connected in parallel with said impedance means and electrically connected to said first means; said second means being triggered conductive for a predetermined time responsive to discharge of said second capacitor, to form a charging circuit for said second capacitor in parallel with said impedance means and bypassing said impedance means; said second means being triggered conductive after said first means has been triggered conductive and then triggered non-conductive responsive to termination of said flash interrupting signal.

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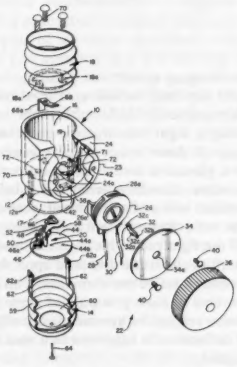
**3,896,334**

## MULTIPLE LEVEL LAMP ADAPTER

**Edward T. Rodriquez, Winchester, Mass., assignor to Creative Technology Corporation, Salem, Mass.**

**Filed Aug. 15, 1973, Ser. No. 388,459**
**Int. Cl.[2] H05B** *37/02, 39/00*
**U.S. Cl. 315—194** **4 Claims**



**1.** A lamp dimmer-adapter comprising
A. a generally cylindrical housing having
1. first and second cavities at opposite ends and
2. a partition between said cavities,
B. a lamp socket shell disposed in said first cavity to receive a lamp bulb therein,
C. a lamp base across said second cavity bearing against a transverse surface of said housing and aligned with said socket shell, said base including a lamp base shell,
D. at least one tab fastened to said base shell and extending through said partition, thereby preventing relative rotational movement between said housing and said lamp base,
E. fastening means for fastening said socket shell and said tabs to said partition with said socket shell in contact with said tabs to provide electrical connection between said base and socket shells and to secure said socket shell and said base to said housing,
F. a socket center contact fastened to said partition in said first cavity and extending through said partition into said second cavity,
G. a base center contact extending from the exterior of said base into the interior thereof,
H. an electronic assembly including solid state switching means and
1. disposed in said base,
2. connected to control conduction between said center contacts by means of said solid state switching means, and
3. arranged for closer thermal coupling with said base than with a lamp in said shell,
I. a control section disposed on a side of said housing, said control section comprising
1. lateral extension of said housing having a third cavity therein,
2. a variable circuit element disposed in said third cavity,
3. a control knob for varying said circuit element, and
J. means connecting said variable circuit element to said electronic assembly for control of the conduction of said solid state switching means by means of said variable circuit element.

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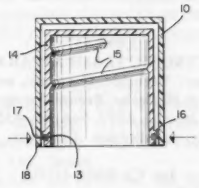
**3,896,335**

## PROTECTIVE AND SAFETY CLOSURE FOR CONTAINERS

**Clayton Bogert, 118 Lowell Rd., Glen Rock, N.J. 07452**

**Filed June 14, 1973, Ser. No. 369,893**
**Int. Cl. B65d** *55/02, 55/56;* **A61j** *1/00*
**U.S. Cl. 215—219** **8 Claims**



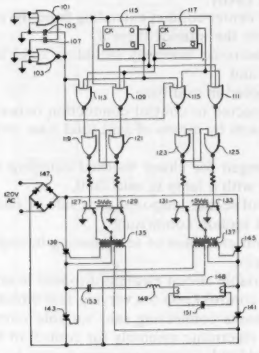

**1.** A protective safety closure for containers having a neck portion comprising:
an inner cap adapted to be fitted over the said neck portion and having a base,
a ledge in proximity to said base,
an outer cap adapted to be fitted to said inner cap and having a base,
a ledge in proximity to said base, and,
serrations in proximity to the ledges on said outer and inner cap adapted to interengage with each other under pressure applied to the outer cap to cause the inner cap to rotate with the outer cap.

3,896,336

## SOLID STATE FLUORESCENT LAMP BALLAST SYSTEM

Max P. Schreiner, Plano, and Tom M. Hyltin, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1973, Ser. No. 426,784
Int. Cl. H05b 37/02
U.S. Cl. 315—226 14 Claims



1. A solid-state fluorescent lamp ballast circuit system comprising:
a gaseous discharge lamp;
full-wave rectifying means for supplying a pulsating voltage;
a first switch coupling one side of the output of said rectifying means to one side of said lamp;
a second switch coupling said one rectifying means side to the other side of said lamp;
a third switch coupling the other side of said rectifying means to said one side of said lamp;
a fourth switch coupling said other side of said rectifying means to said other side of said lamp;
trigger means for providing first and second complementary pulse trains, said first pulse train being coupled to said first and fourth switches, said second pulse trains being coupled to said second and third switches; and
reactive means coupling said switching means to said lamp.

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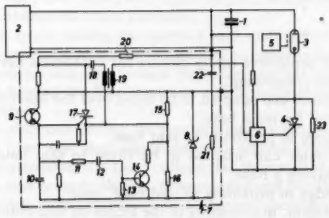
3,896,337

## ELECTRONIC FLASH APPARATUS

Hans-Heino Decker, Vechelde, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Jan. 22, 1974, Ser. No. 435,582
Claims priority, application Germany, Feb. 2, 1973, 2305046
Int. Cl. H05b 41/30
U.S. Cl. 315—241 P 5 Claims



1. Electronic flash apparatus comprising a flash tube for emitting photographic light during discharge of the tube, means for interrupting discharge of said tube to stop emission of light therefrom, and integrating means for integrating light reflected from a subject to be photographed and for providing a signal impulse to said interrupting means when the integrated reflected light reaches a desired value, said integrating means including a photosensitive control member 9, 17 having a control grid and a cathode, said integrating means also including circuit means so arranged that the cathode potential of said photosensitive control member is reduced in accordance with the time change in the voltage prevailing in the control grid, and so that said circuit means emits said signal impulse as soon as said cathode potential falls below said control grid potential, which has been reduced to the extent of the ignition voltage, said circuit means including a voltage divider having two resistors 15, 16 one of which (16) is variable in accordance with the time change of the voltage prevailing in the control grid of the photosensitive control member, and wherein the cathode potential of the photosensitive control member is determined by said voltage divider.

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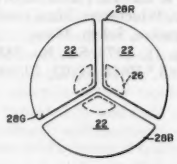
3,896,338

## COLOR VIDEO DISPLAY SYSTEM COMPRISING ELECTROSTATICALLY DEFLECTABLE LIGHT VALVES

Harvey C. Nathanson, and Jens Guldberg, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1973, Ser. No. 411,885
Int. Cl. H01j 29/70
U.S. Cl. 315—373 11 Claims



1. A video imaging system comprising:
a. a cathode ray tube including at least one electron gun;
b. an electrostatically deflectable light valve array target comprising a light transmissive substrate, a plurality of groupings of three spaced apart generally planar light reflective elements individually supported by a spacer-post member extending from the substrate, the spacer-post member being of substantially less cross-section than the light reflective element, and being located entirely beneath the light reflective element, and a light transmissive potential electrode disposed upon the substrate in the space between reflective elements, with respective reflective elements of each grouping of three being deflectable along three respective symmetrically offset primary color axes of deflection in response to a specific primary color video signal;
c. optical means and a light source for directing light onto the respective reflective elements and including selective transmissive portions of the optical means for passing light of a specific primary color from the deformed reflective element to permit focusing of a color image upon a screen, which selective transmissive portions are symmetrically spaced about the central optical axis of the optical means in correspondence to the respective primary color axes of deflection;
d. means for scanning the electron beam from the electron gun and for synchronizing and modulating a video signal to permit sequential activation of respective primary color designated reflective elements.

## 3,896,339

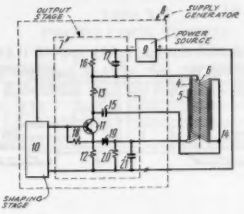
## DEVICE FOR FOCUSSING AND DEFLECTION OF AN ELECTRON BEAM IN A CATHODE-RAY APPARATUS

**Ivan Ivanovich Efimov, ulitsa Stroitelei 7, korpus 1, kv. 96, Moscow; Mikhail Lvovich Lifshits, ulitsa Moskovskaya 3, kv. 18, Lobnya Moskovskoi oblasti; Dmitry Dmitrievich Nikiforov, ulitsa Sretenka, 26/1, kv. 2, Moscow; Viktor Pavlovich Ivanov, Putevoi prozed, 8, kv. 56, Moscow; Lev Efimovich Linetsky, ulitsa Metrostroevskaya, 13/12, kv. 13, Moscow; Vadim Georgievich Lazarev, ulitsa Norilskaya 1, kv. 140, Moscow, and Alexandr Ivanovich Brenin, prozed Cherskogo, 11, kv. 63, Moscow, all of U.S.S.R.**

**Filed July 16, 1973, Ser. No. 379,391**

**Int. Cl. H01j** *29/58, 29/70*

**U.S. Cl. 315—403** **2 Claims**




1. A device for focussing and deflecting an electron beam in a cathode-ray apparatus which comprises two windings disposed coaxially in operative relationship with the apparatus to provide focussing and scanning of the electron beam on the operating surface thereof, said device comprising: supply generator means for producing stabilized direct current for focussing said electron beam and alternating current for deflecting said electron beam, said supply generator means having an operatively interconnected shaping stage and output stage, the input to said output stage being coupled to the output of said shaping stage; and a power source for supplying power to the device which includes a negative lead and a positive lead and is operatively coupled with said shaping and output stages; a pair of windings operatively coupled to said output stage, said pair comprising a first winding and a second winding each having a first lead and a second lead and being connected in series by means of said first leads, the two planes defined by the two sets of turns of the windings of said pair of windings being mutually non-parallel, said planes inclined at equal angles relative to the co-axis of said windings; a transistor of said output stage, said transistor having a collector, an emitter and a base; a first resistor of said output stage which has a first lead and a second lead and is connected to said emitter by means of the first lead thereof; a second resistor of said output stage said second resistor having a first lead and a second lead and connected to said collector by means of the first lead thereof; a first capacitor of said output stage, one lead of said capacitor being connected to said collector, the other lead, to a junction point defining the connection of the windings of said pair of windings, the second lead of said second resistor being connected to the second lead of said first winding; a third resistor of said output stage, a first lead of said third resistor being connected to the second lead of said second resistor, and a second lead of said third transistor, to the negative lead of said power source; a second capacitor connected in parallel with said third resistor; a fourth resistor of said output stage which has a first lead and a second lead and is connected to said base by means of the first lead thereof; a diode of said output stage, a first lead of said diode being connected to the second lead of said fourth resistor, the other lead of said diode being connected to the second lead of said second winding; a fifth resistor of said output stage, a first lead of said fifth resistor being connected to the second lead of said second winding, and a second lead thereof, to the positive lead of said power source; a third capacitor of said output stage connected in parallel with said fifth resistor the second lead of said first resistor being connected to the positive lead of said power source.

## 3,896,340

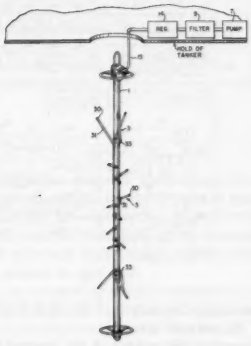
## APPARATUS AND METHOD FOR WASHING AWAY AN ELECTROSTATIC CHARGED MIST IN AN OIL TANKER

**Julian H. Dancy, Richmond, Va., assignor to Texaco Inc., New York, N.Y.**

**Filed Aug. 23, 1973, Ser. No. 390,802**

**Int. Cl. H05f** *3/00*

**U.S. Cl. 317—2 R** **7 Claims**




1. Apparatus for washing away an electrostatic charged mist in a substantially empty hold in an oil tanker, comprising means for providing a supply of liquid at a predetermined pressure and at a predetermined location in the hold of the tanker, means for converting the liquid to drops of a predetermined size, utilizing the electrostatic charged mist to charge the drops during the converting step to an opposite polarity to the polarity of the electrostatic charged mist, and means for distributing the oppositely charged drops throughout the hold so as to substantially wash away the charged mist.

## 3,896,341

## PROTECTING DEVICE FOR A SEMICONDUCTOR MEMORY APPARATUS

**Koji Kodama, Tokyo, Japan, assignor to Tokyo Shibaura Electric Company, Ltd., Japan**

**Filed Apr. 20, 1973, Ser. No. 353,130**

**Claims priority, application Japan, Apr. 22, 1972, 47-40749**

**Int. Cl. H02h** *7/20*

**U.S. Cl. 317—33 R** **3 Claims**

1. Apparatus for protecting the semi-conductor memory elements in a semiconductor device from damage due to abnormal pulses from the driving circuitry thereof, which comprises:

means for sampling a pulse signal from said driving circuitry;

means for time-delaying said pulse signal;

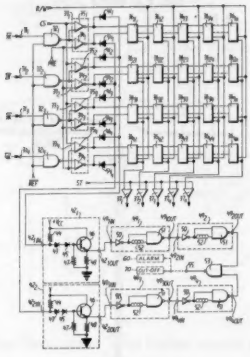
means for comparing said pulse signal with said time-delayed pulse signal and for issuing an output signal indicative of whether said pulse signal exceeds a pre-determined pulse width;

said time-delaying and comparing means comprising

a first inverter having an input and an output for receiving as its input the pulse signal from said driving circuitry;

a second inverter having an input and an output;

a first delay circuit having an input and an output;
a second delay circuit having an input and an output;
a first NAND gate having two inputs and an output;
a second NAND gate having two inputs and an output;
means connecting the output of the first inverter to the input of the first delay circuit and to an input of the first NAND gate;
means connecting the output of the first delay circuit to the other input of the first NAND gate;



means connecting the output of the first NAND gate to the input of the second inverter;
means connecting the output of the second inverter to the input of the second delay circuit and to an input of the second NAND gate;
means connecting the output of the second delay circuit to the other input of the second NAND gate;
the output of the second NAND gate being indicative of whether said pulse signal exceeds a predetermined pulse width.

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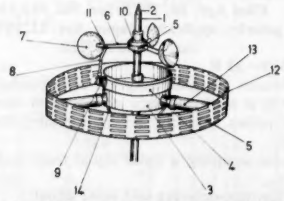
**3,896,342**
**CONSTRUCTION OF RADIOACTIVE LIGHTNING ARRESTERS**

**Enrique Fornes Puget, Madrid, Spain, assignor to Nuclear Iberica S.A., Madrid, Spain**

**Filed Aug. 7, 1972, Ser. No. 278,446**
**Claims priority, application Spain, Aug. 7, 1971, 394004**
**Int. Cl. H02h** *9/04*
**U.S. Cl. 317—61** **5 Claims**



**1.** A radioactive lightning arrester apparatus, the apparatus comprising: a rod connected to the earth; a support mounted concentrically about the rod; a low energy radioactive source comprising one or more cores or nuclei disposed on said support; rotating means rotatably mounted on said rod; a plurality of arms radially emerging from said rotating means, each arm provided at its free end with a cup against which the wind acts in order to cause said rotating means to continually rotate when the wind blows; at least one link means movable with and extending from said rotating means; and a brush carried at the free end of each link, each brush situated facing the radioactive source so that said brush contacts the radioactive source to clean it as said rotating means rotates.

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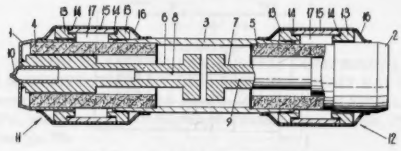
**3,896,343**
**HEAT-OPERATED SHORT-CIRCUITING ARRANGEMENTS**

**Basil Offor Baker, Rickmansworth, and John William Ellis Ross, Sidcup, both of England, assignors to The M-O Valve Company Limited, London, England**

**Filed Mar. 21, 1974, Ser. No. 453,325**
**Claims priority, application United Kingdom, Mar. 23, 1973, 14137/73**
**Int. Cl. H02h** *3/22*
**U.S. Cl. 317—61** **10 Claims**



**1.** A heat-operated short circuiting arrangement comprising: an enclosure formed at least partly of a heat-shrinkable material; a pair of terminals for external connection of the arrangement which provide spaced surfaces within the enclosure; at least one element of a fusible, electrically conductive material housed within the enclosure; and means providing a space within said enclosure between said spaced surfaces through which, on heating of the arrangement, molten material, produced by melting of said fusible material is caused to flow due to shrinking of said heat shrinkable material to establish electrical connection between said spaced surfaces.

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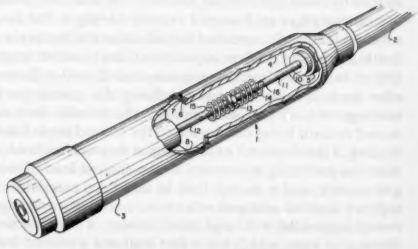
**3,896,344**
**ENGINE IGNITER TIP CONNECTOR WITH COMPENSATION FOR DIFFERENTIAL THERMAL EXPANSION**

**Thomas Parker Haselton, Lynn, Mass., assignor to General Electric Company, Wilmington, Mass.**

**Filed June 5, 1974, Ser. No. 476,525**
**Int. Cl. F23q** *3/00*
**U.S. Cl. 317—96** **1 Claim**



**1.** In an igniter tip connector, the combination comprising:
a. a metallic outer shell adapted to engage the metallic housing of an igniter at one end thereof and the metallic sheath of a cable at the other end thereof,
b. an igniter electrode extending into said metallic outer shell, said igniter electrode being mounted in insu-

lated relationship with the said igniter housing and the said metallic outer shell,

c. a lead wire from said cable extending into said metallic outer shell, said lead wire being mounted in electrically insulated relationship with said metallic outer shell and the said metallic sheath of the cable, the ends of said electrode and said lead wire being separated by a gap which is greater than the maximum differential, thermal expansion between said metallic outer shell and said wire and electrode,

d. axially extensible coil spring means connected between said lead wire and said electrode extending partially into said coil spring which has a diameter larger than the diameters of said wire and said electrode, whereby said spring means absorbs any differential expansion.

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**3,896,345**

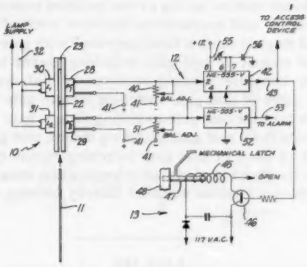
## PHOTO LOCK SYSTEM

**Henry R. Zink, P.O. Box 459, Lake Arrowhead, Calif. 92352**

**Filed Sept. 3, 1974, Ser. No. 502,851**

**Int. Cl.[2] E05B** *47/00*

**U.S. Cl. 317—134** **9 Claims**




1. In an access control system, the combination of:

a receptacle having a first station and a second station and including means defining a slot for receiving a key member for movement past said first station to said second station;

a first radiation sensor mounted at said first station;

a second radiation sensor mounted at said second station;

means for directing radiation across said slot to each of said sensors;

a first transparency mounted at said first station; and

a key member having a second transparency which is the complement of said first transparency, with said second transparency positioned on said key member to move past said second station to said first station as said key member is inserted into said slot, and

with at least the portions of said key member which are at said second station during insertion having an average radiation transmission characteristic substantially the same as that of said second transparency.

**3,896,346**

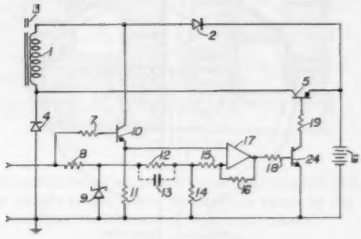
## HIGH SPEED ELECTROMAGNET CONTROL CIRCUIT

**Louis A. Ule, Rolling Hills, Calif., assignor to Electronic Camshaft Corporation, Rolling Hills, Calif.**

**Continuation-in-part of Ser. No. 308,268, Nov. 21, 1972, abandoned. This application July 10, 1973, Ser. No. 377,956**

**Int. Cl. H01h** *47/32*

**U.S. Cl. 317—154** **2 Claims**



1. In combination with an electromagnetically operated device, a circuit for producing rapid current growth in the coil of said device, and for maintaining a predetermined level of current in said coil, an electrical circuit comprising:

a source of relatively high voltage capable of effecting rapid current growth in said coil;

semiconductor switching means responsive to external control for applying said high voltage source to energize said coil, said semiconductor switching means operating in a switching mode as a substantially non-dissipative element;

first means for sensing the current in said coil to open said semiconductor switching means when a predetermined coil current value is reached, and for closing said switch intermittently thereafter, to maintain said predetermined coil current value;

and second means subject to external control for applying said high voltage source to said coil in opposite polarity, thereby accelerating the rate of current decline in said coil.

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**3,896,347**

## CORONA WIND GENERATING DEVICE

**Peter Charles Gelfand, Lebanon, Pa., assignor to Envirotech Corporation, Menlo Park, Calif.**

**Filed May 30, 1974, Ser. No. 474,625**

**Int. Cl. B03c** *3/74*

**U.S. Cl. 317—262 E** **13 Claims**

1. A device for generating a corona wind comprising:

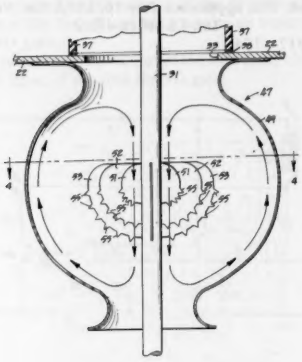
a. an electrically conductive rod-like member adapted for connection to a high-voltage source;

b. an electrically conductive shell mounted to spacedly surround said rod-like member and having a first open mouth at one end thereof through which said rod-like member passes, said first mouth being relatively large compared to the diameter of said rod-like member;

c. a plurality of thin plate-like members, each fastened on edge in a circumferential series around said rod-like member to extend outwardly therefrom toward said shell; portions of the outer peripheral edges of said plate-like members having a plurality of corona-emitting points formed thereon, said points being generally directed outwardly and toward said first mouth;

d. the surrounding wall of said shell being spaced radially apart from the peripheral edges of said plate-like members, said shell being adapted for connection to an electrical ground so that electrical discharge from said points is

directed toward said shell to cause a gaseous flow within said shell in the space between said shell and said rod-like



member when said rod-like member is charged to a high voltage.

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## 3,896,348
## CIRCUIT FOR SUPPLYING A DC LOAD FROM AN AC SOURCE THROUGH A RECTIFIER

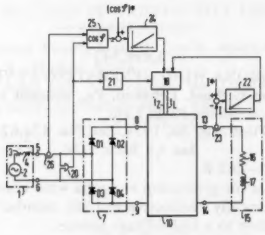
**Peter Loderer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed July 2, 1974, Ser. No. 485,088**

**Claims priority, application Germany, July 2, 1973, 2333570**

**Int. Cl. H02p** *13/16;* **H02m** *1/12*

**U.S. Cl. 318—227** **12 Claims**



1. In a circuit for supplying a DC load from an AC seurce through an uncontrolled rectifier and a DC control element arranged between the output of the rectifier and the DC load, the control unit of the DC control element being synchronized with the AC source and arranged to keep the power factor at a predetermined value, a capacitor being associated with the DC control element for storing energy, and a by-pass diode bridged across the DC load, an improved arrangement for suppressing unwanted harmonics comprising:

a. a first and second by-pass diodes connected in series in the same direction across the load;

b. a capacitor associated with the DC control element coupled between one input terminal of the DC control element and the center of the two by-pass diodes.

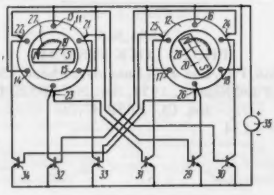
## 3,896,349
## ELECTRIC DRIVE FOR MOTORS INTERCONNECTED TO FORM A RING CIRCUIT

**Valery Konstantinovich Lozenko, ulitsa Krasny Kazanets, 19, korpus 1, kv. 258; Vladimir Alexandrovich Morozov, ulitsa Krasny Kazanets, 19, korpus 1, kv. 80; Vladimir Serafimovich Pavlikhin, Aviamotornaya ulitsa, 4, korpus 2, kv. 108; Anatoly Mikhailovich Santalov, Chasovaya ulitsa 14, kv. 23, all of Moscow; Leonid Nikolaevich Negodyaev, ulitsa Volodarskogo, 99a, kv. 5, and Jury Ivanovich Kiryanov, ulitsa Solidarnosti, 11, kv. 61, both of Kirov, all of U.S.S.R.**

**Filed Feb. 27, 1974, Ser. No. 446,513**

**Int. Cl. H02p** *5/46, 7/68*

**U.S. Cl. 318—85** **15 Claims**



1. An electric drive comprising: at least two gatecontrolled electric motors, each of said gate-controlled electric motors comprising a synchronous machine, each of said gate-controlled electric motors having a rotor position sensor mounted on the shaft of said synchronous machine, each of said gate-controlled electric motors being provided with gate switching means, an output of said gate switching means being connected to armature winding sections of said synchronous machine; gates of said gate switching means; gate switch on control circuits for said gate switching means; gate switch off control circuits for said gate switching means, said gate switch on circuit of each of said gate switching means being connected to the first input of said rotor position sensor of each subsequent synchronous machine thereby forming a ring circuit.

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## 3,896,350
## ENERGIZATION CIRCUIT FOR DYNAMO ELECTRIC MACHINES DRIVING, OR BRAKING VEHICLE WHEELS

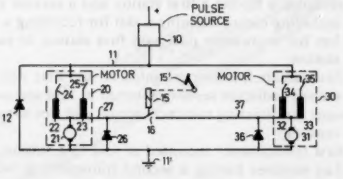
**Dieter Kipp, Aurich, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany**

**Filed Jan. 16, 1974, Ser. No. 433,749**

**Claims priority, application Germany, Jan. 25, 1973, 2303555**

**Int. Cl.² H02P** *3/00*

**U.S. Cl. 318—87** **4 Claims**




1. In a drive system having at least two series-type dynamo electric machines (**20, 30**) connected to at least two loads, such as vehicle wheels, an energization circuit for said dynamo electric machines arranged to selectively connect said dynamo electric machines to operate in motor mode driving the loads, or to operate in generator mode, effecting dynamic braking of the loads,

means (24, 25; 34, 35) controlling the direction of energization of the fields (22, 23; 32, 33) of the dynamo electric machines to selectively operate in either of said modes; and switch means (15, 16) selectively directly cross connecting the armatures (21, 31) of the dynamo electric machines so as to place the armatures in a parallel circuit relationship when said mode control means (24, 25; 34, 35) energizes the fields in a direction to operate the dynamo electric machine in a generator-dynamic braking mode, said cross-connecting switch means forming a bypass circuit for circulating currents between the armatures (21, 31) arising due to differences in voltages across said armatures when the dynamo electric machines (29, 30) operate in generator mode, and said switch means selectively interrupting said parallel circuit cross connection of the armatures (21, 31) of the machines (20, 30) when the dynamo electric machines (20, 30) operate in motor mode.

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**3,896,351**

## CONTROL ARRANGEMENT FOR A SELF-CONTROLLED SYNCHRONOUS MACHINE

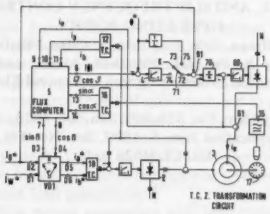
**Felix Blaschke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Aug. 19, 1974, Ser. No. 498,751**

**Claims priority, application Germany, Aug. 23, 1973, 2342653**

**Int. Cl. H02p** *5/28*

**U.S. Cl. 318—175** **7 Claims**



1. In a converter fed, self-controlled synchronous machine having an excitation current control, a flux computer having as one output the cosine of the rotor angle and means to establish predetermined field-parallel and field-orthogonal components of the stator current, an improved regulating arrangement comprising; dividing means having its output coupled as a reference input to the excitation control and having as a dividend input a quantity proportional to the desired magnetizing current and as a divisor input, a quantity proportional to the cosine of the rotor angle obtained from the flux computer.

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**3,896,352**

## LIGHTNING ARRESTERS AND SURGE DIVERTERS

**William Walter James Miles, Buckhurst Hill, England, assignor to Bowthorpe Hellermann Limited, Crawley, Sussex, England**

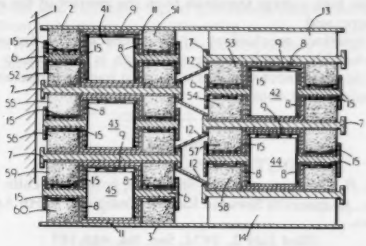
**Filed Oct. 23, 1973, Ser. No. 408,636**

**Claims priority, application United Kingdom, Oct. 23, 1972, 48803/72**

**Int. Cl. H02h** *9/06*

**U.S. Cl. 317—68** **4 Claims**

1. A high voltage device comprising a casing housing, a plurality of series connected components arranged in two or more stacks, each component in anyone of the stacks being electrically connected directly to a component in the other or one of the other stacks, said components each comprising a central annular ceramic plate, an annular non-linear resistor located on each side of the central plate, a spark gap unit located in the aperture defined by the central plate, two contact plates, one arranged on each side of the central plate so as to cover its surface and the aperture therein, and a cup-shaped insulation member arranged over the central portion of the contact plate on each side of the central plate,



the components being separated by circular ceramic plates so that the weight of the whole assembly is taken by the cup-shaped insulation members and the central plates.

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**3,896,353**

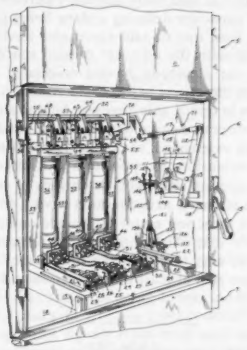
## ENCLOSED HIGH VOLTAGE MOTOR CONTROL WITH INTERLOCKING ELEMENTS

**Lawrence A. Burton, Oconomowoc, and Gustav W. Doos, Shorewood, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.**

**Filed Jan. 14, 1974, Ser. No. 433,350**

**Int. Cl. H02b** *11/14*

**U.S. Cl. 317—103** **9 Claims**



1. In a high voltage motor control the combination comprising:

an enclosure having a door and a handle which is operable between a locked and unlocked position to allow entry into the enclosure through the door;

a plurality of current conducting paths contained within said enclosure conducting load current between a set of high voltage terminals on the back of said enclosure and a set of load lines;

guide means mounted to the enclosure floor;

a carriage which is slidably received by said guide means and retained thereby in an operating position, said carriage including a contactor which is electrically connected into said current conducting paths when said carriage is in said operating position, said contactor being operable to conduct load current when energized and to interrupt conduction of load current when deenergized; a fuse assembly mounted to the back wall of said enclosure and including a set of fuses which are electrically connected into said current conducting paths;

a disconnect assembly mounted to the back wall of said enclosure above said fuse assembly and including a set of disconnect switches which are electrically connected into

said current conducting paths and which are operable between a closed position in which they conduct load current from said high voltage terminals on the back of said enclosure and an open position in which they isolate the high voltage terminals from the interior of the enclosure; and

an interlock mechanism which connects said disconnect assembly to said handle and which is operable to open said disconnect switches when said handle is operated to unlock said door.

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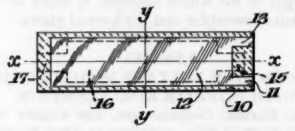
## 3,896,354
## MONOLITHIC CERAMIC CAPACITOR

**James H. Coleman, and Jyh-Shuey Lo, both of Wichita Falls, Tex., assignors to Sprague Electric Company, North Adams, Mass.**

**Filed July 2, 1974, Ser. No. 485,187**
**Int. Cl. H01g** *3/06*
**U.S. Cl. 317—258** **5 Claims**




1. A monolithic ceramic capacitor comprising a dielectric ceramic body; a plurality of spaced mutually parallel film electrodes buried in said body, mutually perpendicular X and Y axes of said capacitor defining a plane being parallel to said electrodes, at least one of said electrodes having a common area of overlap with the adjacent of said spaced electrodes, said at least one electrode having co-planar extensions in opposite X axis directions beyond said common overlap area, said extensions in one X axis direction having an accumulated width in the y direction equal to the accumulated width of said opposite X axis extensions, each said adjacent electrode having co-planar extensions in opposite Y axis directions beyond said common overlap area, said extensions of said each adjacent electrode in one Y axis direction having an accumulated length in the x direction equal to the accumulated length of said opposite Y axis extensions; and a connective means at spaced faces of said body for the purpose of connecting a voltage between said at least one electrode and said adjacent electrodes.

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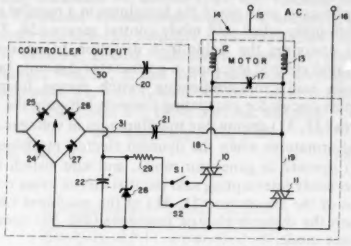
## 3,896,355
## SELF-POWERED THYRISTOR TRIGGER CIRCUIT

**Eugene H. Guicheteau, Audubon, Pa., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed June 13, 1974, Ser. No. 478,944**
**Int. Cl. H02p** *1/40*
**U.S. Cl. 318—207** **6 Claims**

1. A power control circuit including in combination first and second semiconductor load carrying gate controlled conducting devices each having a pair of load terminals connected in series circuit relationship with an individually associated inductive impedance load across a pair of alternating current power supply terminals, and control circuit means coupled to and controlling said gate controlled conducting devices comprising means for providing a unidirectional gating potential, said last mentioned means comprising a filter capacitor having a first terminal connected to the junction of one of said power supply terminals and one of said load terminals of each of said gate controlled conductive devices, said filter capacitor having a second terminal connected by first and second circuits to the other one of said power supply terminals, each of said first and second circuits including a rectifier, a current limiting capacitor and an associated one of said load devices, and gating means operatively coupled to said filter capacitor and selectively operable to be coupled to the control gate of one or the other of said load current carrying gate controlled conducting devices for applying a gating-on signal to said device to cause the same to conduct load current therethrough.

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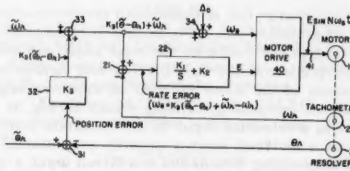
## 3,896,356
## METHOD AND CONTROL SYSTEM FOR IMPROVED STABILITY OF AN INDUCTION MOTOR VIA INDEPENDENT VOLTAGE, SYNCHRONOUS FREQUENCY, AND SLIP FREQUENCY CONTROL AT AN OPERATING POINT

**Robert E. Hoffman, Erie, Pa.; John A. Cline, Pittsfield, Mass.; Christopher S. Fuselier, Pittsfield, Mass., and John D. D'Atre, Pittsfield, Mass., assignors to General Electric Company**

**Continuation of Ser. No. 326,449, Jan. 24, 1973, abandoned. This application June 5, 1974, Ser. No. 476,433**
**Int. Cl. H02p** *5/40*
**U.S. Cl. 318—227** **9 Claims**




1. In a system for controlling a motor having a stator and a rotor for stable operation over a wide range of rotor speeds wherein motor control is effected by control of the amplitude and frequency components of the drive voltage applied to the motor, apparatus for control of the motor slip frequency comprising the combination of independent:

a. means for variation of the voltage amplitude responsive to a function of the algebraic sum of the commanded and actual rotor speeds; and

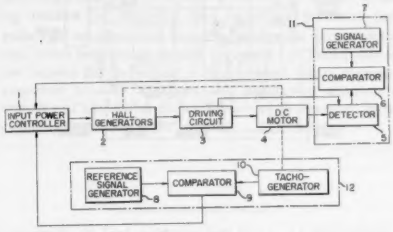
b. means for variation of the frequency of the said voltage applied to said motor responsive to a function of the algebraic sum of said commanded rotor speed and the desired slip frequency;

said means for variation being independent of each other and said means for variation of the frequency being independent of rotor speed whereby variation of said voltage amplitude will not cause a reactionary change in motor frequency and whereby the actual slip frequency of said motor is free to vary until true rotor speed approaches the desired rotor speed.

## 3,896,357
## DRIVING SYSTEM FOR DC MOTORS WITH HALL GENERATORS

**Kinji Tanikoshi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Aug. 23, 1973, Ser. No. 391,025**
**Claims priority, application Japan, Aug. 31, 1972, 47-87349; Nov. 10, 1972, 47-112626**
**Int. Cl. H02k** *29/00*
**U.S. Cl. 318—254** **15 Claims**




1. A DC motor and driving control system therefor comprising, in combination;

a. a rotor having magnetic poles of opposite polarities thereon;

b. a stator having flux-producing windings positioned in torque-producing relation to said rotor;

c. Hall generators positioned in flux-sensing relationship to said magnetic poles and actuatable to detect the instantaneous rotational speed of said rotor and to generate electrical signals with a frequency responding to the rotational speed of said DC motor;

d. driving means having transistors for applying an exciting current to said windings in response to the output signals from said Hall generators;

e. detecting means connected with said transistors in said driving means to detect a saturated state of said transistors;

f. signal generating means for generating a signal corresponding to a predetermined voltage lower than a saturation voltage of said transistors in said driving means so as not to saturate said transistors;

g. comparator means for comparing the output signal of said detecting means with the output signal of said generating means so as to generate a signal representing the difference therebetween; and

h. means for controlling the voltage to be applied to said Hall generators in response to the output signal of said comparator means, thereby controlling the level of the output signals of said Hall generators.

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## 3,896,358
## SYNCHRONOUS DRIVE SYSTEM FOR A D.C. MOTOR

**Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Seiki Kabushiki Kaisha and Canon Kabushiki Kaisha, both of Tokyo, Japan**

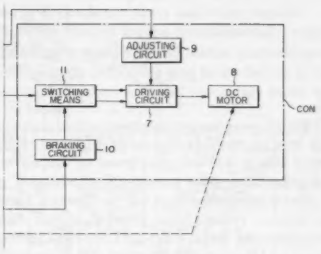
**Filed July 17, 1974, Ser. No. 489,088**
**Claims priority, application Japan, July 24, 1973, 48-83277**
**Int. Cl. H02p** *5/16*
**U.S. Cl. 318—314** **16 Claims**

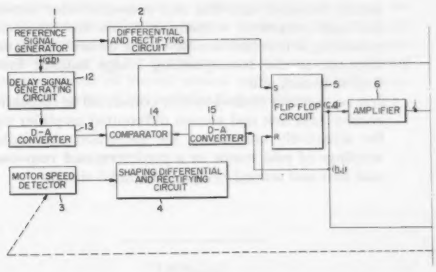
1. A drive system for a D.C. motor comprising:

reference signal generating means having a predetermined frequency,

motor speed detecting means for generating a signal of frequency corresponding to rotational speed of the D.C. motor,

synchronous drive controlling means for the motor, said controlling means being disposed so as to receive signals from said reference signal generating means and signals from said motor speed detecting means and generating driving signals for the motor corresponding to the phase difference between both said signals,




delaying means connected to said reference signal generating means to delay said reference signal for a predetermined time, and

adjusting means capable of being connected to said delaying means and said synchronous drive controlling means and comparing input signals from both said means so as to adjust the output of said synchronous drive controlling means, said adjusting means controlling duty of driving current for the D.C. motor to the value close to approximately 100%.

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## 3,896,359
## MULTISPEED CONTROL SYSTEM

**Charles C. Olander, Huntington Beach, and Michael J. Caparone, Arcadia, both of Calif., assignors to Robertshaw Control Company, Richmond, Va.**

**Filed Jan. 19, 1973, Ser. No. 325,182**
**Int. Cl. H02p** *7/58*
**U.S. Cl. 318—334** **1 Claim**

1. A multispeed control system for selecting the number of isolated windings for excitation in a multi-winding electrical motor in response to selected discrete amplitudes of a sensed parameter, comprising:

electrical power supply means for providing a D.C. electrical signal;

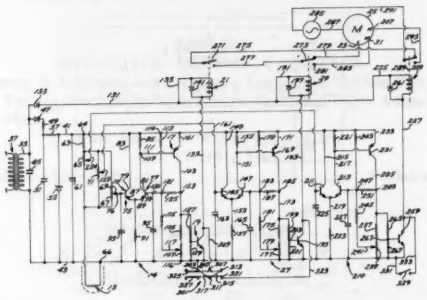
parameter responsive means disposed to respond to said

sensed parameter in a predetermined relationship of electrical resistance corresponding to the amplitude of said sensed parameter;

a first and second resistive divider network connected in parallel for excitation across said power supply means and across said parameter responsive means as one element thereof;

a first and second differential amplifier respectively connected between said first and second divider networks and said parameter responsive means for respectively producing a first and second bridge differential signal in response to the corresponding bridge balance formed therebetween; and

a first and second control circuit connected to respectively receive said first and second differential amplifier signal for selectively connecting for excitation said isolated windings of said motor in a predetermined response to said first and second bridge differential signals.



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**3,896,360**

**METHOD AND APPARATUS FOR AUTOMATIC FORWARD FEED PROGRAMMED CONTROL OF A MACHINE TOOL**

**Jurgen Meyer, and Siegfried Waller, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

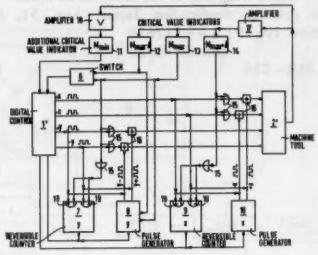
**Continuation-in-part of Ser. No. 866,507, Oct. 15, 1969, abandoned. This application May 27, 1971, Ser. No. 147,707**

**Claims priority, application Germany, Oct. 18, 1968, 1803742**

**Int. Cl. G05b** *19/24*

**U.S. Cl. 318—571** **2 Claims**

1. Apparatus for optimum adjustment of a digitally controlled machine tool in the machining process of a workpiece (W) wherein a control system of a programmed contour includes feeding means for transmitting appropriate control commands to the machine tool and for regulating the relative speed of the machine tool to the workpiece in accordance with the forming power applied to the workpiece in a manner whereby the feed speed is decreased when the forming power is increased and the feed speed is increased when the forming power is decreased, said apparatus comprising work feeding means for changing the programmed contour in the direction of decreasing processing depth ($+y$) when the forming power ($M_d$) exceeds a predetermined level ($M_{max}$) and for continuing the process in the direction of increasing processing depth ($-y$) to a maximum of the programmed contour when the forming power is less than a predetermined lower level ($M_{max} - \Delta$); reversible counter means for digitally storing deviations from the programmed contour; and additional work feeding means for additionally utilizing the deviations for controlling



the movement ($x$, $y$) of the machine tool to decrease said deviations in a manner whereby the contour is repeatedly removed until the actual contour of the workpiece coincides with the programmed contour.

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**3,896,361**

**METHOD AND APPARATUS FOR COMPENSATING AN ERROR IN NUMERICAL CONTROL**

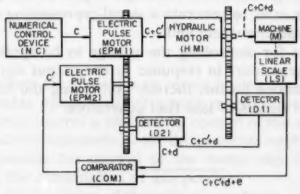
**Seiuemon Inaba; Kanryo Shimizu, both of Kawasaki; Yoshihiro Hashimoto, Yokohama; Youichi Amemiya, Tokyo, and Hiroshi Usami, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan**

**Filed Oct. 12, 1970, Ser. No. 80,041**

**Claims priority, application Japan, Oct. 24, 1969, 44-85138**

**Int. Cl. G05b** *5/01*; **G05d** *23/275*

**U.S. Cl. 318—616** **2 Claims**



1. In a numerical control system including pulse motor means for driving a movable element of a machine, means for generating pulses in proportion to the actual velocity of said movable element, and means for supplying command velocity input pulses, an improvement for compensating for an error in said numerical control system comprising,

means for applying input signals to said pulse motor means to drive said pulse motor means to control a velocity of movement of said movable element,

deviation signal generating means having an input for application of said command velocity input pulses and having an output for producing deviation signal pulses in proportion to a command velocity determined by said command input pulses,

means for combining said command input pulses, said deviation signal pulses, and said actual velocity pulses to produce compensating pulses,

means for applying said compensating pulses and said command velocity input pulses to said means for applying input signals to said pulse motor means, said means for applying input signals to said pulse motor means including means for applying said command velocity input pulses as an electrical input to said pulse motor means, and pulse responsive means connected to said pulse motor means for supplying a mechanical input thereto in response to said compensating pulses for altering the velocity of said pulse motor means as determined by said command velocity input pulses.

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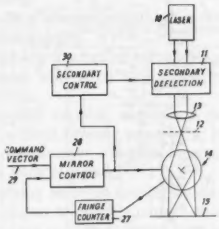
## 3,896,362
## LIGHT-BEAM STEERING APPARATUS

**Graham Stewart Brandon Street, 115, Perse Way, Cambridge, England**

**Continuation-in-part of Ser. No. 82,643, Oct. 21, 1970, abandoned. This application Nov. 30, 1972, Ser. No. 310,679**
**Int. Cl. G05b *1/06***
**U.S. Cl. 318—640** **22 Claims**




1. Light beam steering apparatus, comprising:

a light source generating a light beam to be steered by deflection thereof;

steering mirror means located in the path of said light beam from said source and repositionable at a first speed for deflecting said light beam within a wide range of beam deflectng positions;

servo-control means controlling said steering mirror means and comprising

a. first input means for receiving command signals corresponding to a required mirror means position,

b. feed-back input means connected to said mirror means for receiving feed-back position signals representing actual mirror means position,

c. means connected to said first input means and said feed-back input means for generating error signals representing at each instant the departure of the actual mirror position indicated by the feed-back signals from the mirror position required by the command signals, and

d. first means connected to said error signal generating means for controlling the movement of said mirror means in dependence upon said error signals;

secondary beam control means simultaneously responsive to the same error signals as said mirror controlling means for simultaneously deflecting said beam before it reaches said steering mirror means, said secondary beam control means including

a. a secondary deflection system positioned in the path of said light beam between said source and said steering mirror means for accurately deflecting said beam at a faster second speed within a narrower range of beam positions incident on the steering mirror means, and

b. second means defining a secondary control circuit connected between said error signal generating means and said secondary deflection system and responsive to the same said error signals for causing said secondary deflection system to correct the beam position in accordance with said same error signals;

whereby said secondary beam control means rapidly deflects, within its narrow range, the beam incident on the steering mirror means to dynamically compensate for instantaneous deflection error in the beam emerging from such steering mirror means, simultaneously with at least partial execution by the slower but wider range steering mirror means of moves toward each of a rapidly commanded series of beam deflecting positions.

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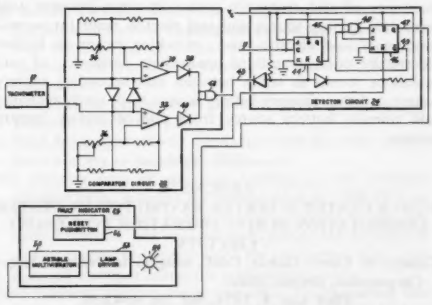
## 3,896,363
## FEEDBACK CIRCUIT FOR DETECTING THE FAILURE OF A STEPPING MOTOR TO RESPOND TO THE CONTROL CIRCUIT

**Robert Carl Kinsel, and Robert Nick Magee, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Mar. 18, 1974, Ser. No. 451,775**
**Int. Cl.[2] G05B *19/40***
**U.S. Cl. 318—685** **4 Claims**




1. An apparatus for detecting the failure of a stepping motor to respond to input pulses generated by a control circuit, the apparatus comprising:

a. a velocity transducer in mechanical communication with the stepping motor for providing a first output analog signal in response to the stepping motor rotating in one direction and a second output analog signal in response to the stepping motor rotating in an opposite direction;
b. means connected to the velocity transducer for producing an analog feedback signal in response to the output analog signals;
c. means responsive to the input pulses and the analog feedback signal for generating an error signal in response to the presence of the input pulses and the absence of corresponding analog feedback signals; and
d. means responsive to the error signal for producing an indication of an error condition.

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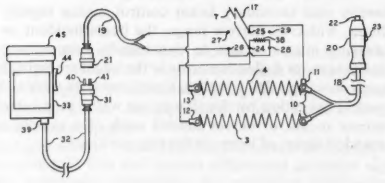
**3,896,364**

## ELECTRIC RAZOR ADAPTER

**Richard A. Reister, Box 110, O. W. S. Rd., Yucca Valley, Calif. 92284**

**Continuation-in-part of Ser. No. 388,572, Aug. 15, 1973, abandoned. This application Oct. 18, 1974, Ser. No. 516,612**
**Int. Cl. H02j** *7/00*
**U.S. Cl. 320—2** **30 Claims**



**1.** An adapter for an electric razor suitable for transportation vehicles wherein said electric razor has a primary self-contained battery source for operation of said electric razor, said adapter comprizing: appropriate electrical resistance means, means to electrically connect the input of said electrical resistance means to a secondary battery source such as in transportation vehicles, said secondary battery source being of higher voltage than said primary battery source, means to electrically connect the output of said electrical resistance means to the input of said electric razor, switching means to electrically connect a first appropriate resistance of said resistance means in series between said secondary battery source and said electric razor to start said electric razor, switching means to further electrically connect a second appropriate resistance of said resistance means in series between said secondary battery source and said electric razor for normal running of said electric razor, switching means to further electrically connect a third appropriate resistance of said resistance means in series between said secondary battery source and said primary battery source to properly recharge said primary battery source from said secondary battery source.

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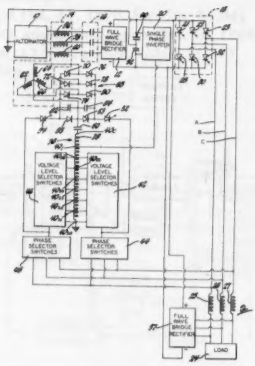
**3,896,365**

## POWER CENTER INVERTER HAVING POWER CENTER COMMUTATION DURING OPERATION INTO SHORT CIRCUITS

**Thomas M. Corry, Goleta, Calif., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 5, 1974, Ser. No. 494,630**
**Int. Cl. H02m** *7/52*
**U.S. Cl. 321—5** **2 Claims**

**1.** A three-phase power center inverter having continued operation into a short circuit load comprising: means for generating an alternating signal referenced to a neutral potential; a full-wave rectifier coupled to the last mentioned means for rectifying the alternating signal and supplying a first unidirectional voltage; a first inverter connected to the rectifying means for producing by controlled rectifier action, three-phase, full-wave, flat-top voltage segments; a three-phase load; three impedance means; a set of three-phase line conductors, each interconnecting the first inverter and the load through a respective one of the three impedance means, each segment of the three-phase, full-wave, flat-top voltage segments being terminated by a commutating voltage on the respective line conductor; a second inverter connected to the rectifying means and operating in synchronism with the first inverter for producing at its output, single-phase, flat-top voltages alternating between the upper and lower potential at a rate three times the frequency of the three-phase voltage segments produced by the first inverter; an inductor having an input tap connected to the output of the second inverter, a low voltage tap connected to the neutral potential, a plurality of intermediate voltage taps between the low voltage tap and the input tap and a step-up tap in voltage multiplying position in relation to the flat-top voltage; a voltage distributor including first and second phase selectors, each having an input and means for selectively coupling said input to the line conductors in synchronism with the first inverter; means for connecting the low voltage and intermediate taps in ascending and descending order in synchronism with the first inverter to the inputs of each of the first and second phase selectors during the period said phase selectors are coupled to a respective line conductor to approximate on the line conductors, in relation to the neutral potential, a balanced and symmetrical voltage; a current sensor for sensing the current output of the means for generating an alternating signal and providing a second unidirectional voltage; first and second series coupled capacitors; means for coupling the second unidirectional voltage across the series coupled capacitors for charging said capacitors; first and second diodes each coupled in parallel with a respective one of the first and second capacitors and being poled so as to prevent discharge of the capacitor parallel coupled therewith; means for coupling the junction between the series coupled capacitors to the step-up tap; and means effective at the beginning of each of the periods the phase selectors are coupled to a line conductor for momentarily coupling a respective one of the high and low voltage sides of



the series coupled capacitors to said last mentioned line conductor at a point intermediate the respective impedance means and the first inverter so as to commutate the first inverter, whereby said capacitors function to provide commutating power for commutating the first inverter in the event of a short circuit in the three-phase load.

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## 3,896,366
## D.C. TO D.C. CONVERTER WITH CONDUCTIVE ISOLATION

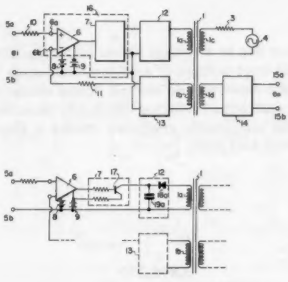
**Seiji Onogi, Kamakura, Japan, assignor to Yamatake-Honeywell Company Limited, Tokyo, Japan**

**Filed Sept. 28, 1973, Ser. No. 401,706**

**Claims priority, application Japan, Sept. 29, 1972, 47-97801; Sept. 29, 1972, 47-97802; Sept. 29, 1972, 47-97803**

**Int. Cl. H02p** *13/04;* **G05f** *7/00*

**U.S. Cl. 321—16** **8 Claims**



1. An isolating signal transducer comprising,

a transformer having at least a control winding and an exciter winding,

a fixed impedance member serially connected with respect to said exciter winding,

means for applying a substantially constant a.c. excitation signal through said fixed impedance member to said exciter winding,

a signal controlled variable impedance means connected across said control winding whereby to control the loading of said transformer windings in accordance with an applied d.c. control signal,

means for applying an input control signal to said variable impedance means to effect a control thereof, and

means for deriving an output signal from said transformer corresponding to the input control signal but conductively isolated therefrom,

said means for applying said input control signal to said variable impedance means comprising a differential amplifier.

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## 3,896,367
## CIRCUIT FOR REDUCING TURN-ON AND TURN-OFF TIMES OF INDUCTIVE LOADS

**Claude Frantz, Kistlerhofstrasse 143, 8000 Munich 70, Germany**

**Filed Mar. 1, 1974, Ser. No. 447,152**

**Claims priority, application Germany, Mar. 7, 1973, 2311340**

**Int. Cl.[2] H01H** *47/32*

**U.S. Cl. 323—6** **1 Claim**

1. A circuit for obtaining a reduced turn-on or turn-off of an inductive load, said circuit comprising, in combination:

a first transistor having a collector, an emitter, and a base and operative to be conductive for a pulse signal applied to its base;

a first diode connected to the collector of said first transistor and operative to be conductive when said first transistor is conductive;

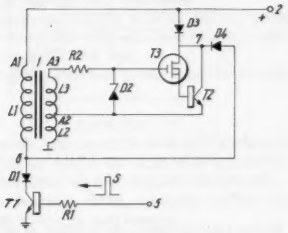
said inductive load including a load winding and a control winding inductively coupled to said load winding;

first connecting means connecting said first diode in series connection with one end of said load winding;

a voltage supply means connected in series with the other end of said load winding;

a pulse signal source connected to the base of said first transistor and operative to make said first transistor conductive;

a MOS-FET having gate, source and drain electrodes and having its gate coupled to one end of said control windings;



a second transistor having a collector, an emitter, and a base and connected to said MOS-FET in a Darlington connection and connected to the other end of said control winding, whereby said MOS-FET becomes conductive when said first transistor is conductive;

an auxiliary winding inductively coupled to said load winding and said control winding and connected at one end to said second transistor and operative for increasing the current flow in said load winding when said MOS-FET is conductive;

a second diode conductively connecting said voltage supply means to said MOS-FET;

a third diode conductively connected with the other of said load winding to said MOS-FET;

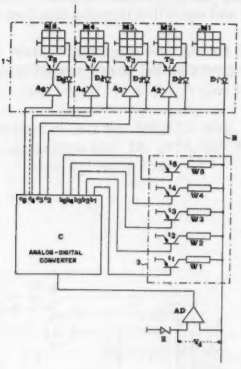
the winding ratio of said load winding to said auxiliary winding being selected for turning on said MOS-FET by the voltage induced in said auxiliary winding by the current flowing in said load winding, during the turning off of said current and to terminate the conduction when said induced transient current is substantially zero;

said auxiliary winding being operative for increasing the current flow in said load winding when said MOS-FET is conductive, whereby the turn-on time of said inductive load is substantially decreased with respect to the normal time.

## 3,896,368
## VOLTAGE REGULATING DEVICE

**Christian Rym, Nalinnes, Belgium, assignor to ACEC (Ateliers de Constructions Electriques de Charleroi), Charleroe, Belgium**

**Filed Oct. 19, 1973, Ser. No. 408,114**
**Claims priority, application Belgium, Oct. 20, 1972, 4503; Mar. 19, 1973, 4905; Mar. 19, 1973, 4907**
**Int. Cl. B64g *1/30*; G05f *1/46***
**U.S. Cl. 323—8** **8 Claims**




1. A device for regulating the voltage of an energy source constituted of a plurality of solar cells grouped into modules, each module having one terminal connected to a common conductor and another terminal connected through a diode to a distribution conductor, said device comprising:

an electronic interrupter connected to the common conductor and the diode connected terminal of each module so as to short-circuit the module;

a proportional shunt connected between the distribution conductor and the common conductor;

a differential amplifier connected between said distribution conductor and a reference voltage generating device; and an analog-digital converter the input of which is connected to the output of said differential amplifier and a part of the binary outputs of which control said electronic interrupters, the remaining binary outputs controlling said proportional shunt.

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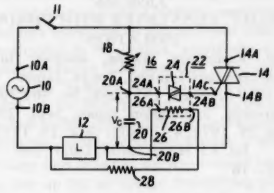
## 3,896,369
## CIRCUIT FOR SOFT-STARTING ELECTRIC LOAD COMPRISING TEMPERATURE SENSITIVE DIAC

**Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed Aug. 27, 1974, Ser. No. 500,855**
**Claims priority, application Japan, Aug. 30, 1973, 48-97651**
**Int. Cl. G05f *1/44***
**U.S. Cl. 323—19** **7 Claims**

1. A circuit for soft-starting an electric load, comprising, in combination, thyristor means serially connected to an electric load across a source of alternating current, circuit means including a capacitor connected to said source and a semiconductor thermally sensitive switch element having a break-over voltage decreased with an increase in temperature, said circuit means being operative to trigger said thyristor in response to said break-over of said semiconductor thermally sensitive




switch element due to a voltage across said capacitor exceeding said break-over voltage of said semiconductor thermally sensitive switch element, and electric heater means thermally coupled to said semiconductor thermally sensitive switch element to be electrically energized during a flow of load current through said load.

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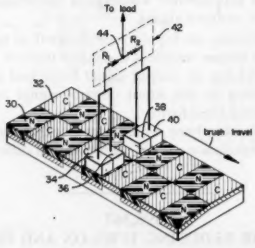
## 3,896,370
## VARIABLE TRANSFORMER

**August Frederick Manz, Union, N.J., assignor to Union Carbide Corporation, New York, N.Y.**

**Filed Dec. 3, 1973, Ser. No. 421,330**
**Int. Cl. G05f *3/04***
**U.S. Cl. 323—43.5 R** **8 Claims**




1. A variable output voltage transformer comprising: a core; a coil winding having multiple turns of conductor successively wound around said core and being electrically insulated from

one another with each turn having an exposed predetermined area consisting of at least one conductive surface segment and one nonconductive surface segment respectively; at least two electrically conductive members arranged for sliding engagement against said predetermined area of each turn along separate paths transverse to the direction of the winding with each path including one surface segment of each of said predetermined areas, and wherein such surface segments alternate so as to form a checkered geometric pattern of conductive and nonconductive surface segments respectively and circuit means for coupling said electrically conductive members in a series relationship with each other.

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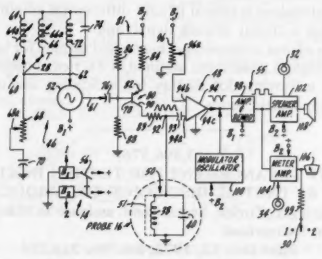
## 3,896,371
## METAL DETECTOR WITH A RESONATING CIRCUIT BEING DRIVEN BY A FREQUENCY HIGHER THAN ITS NATURAL RESONANCE FREQUENCY

**Allen W. Hametta, 629 Evergreen Pl., Buffalo Grove, Ill. 60090**

**Filed Dec. 17, 1973, Ser. No. 425,520**
**Int. Cl.[2] G01V** *3/10*
**U.S. Cl. 324—3** **5 Claims**




1. A metal detecting device having a discriminating mode in which said device discriminates between different types of metal objects such as, for example, coins like pennies and junk objects like pull tabs, bottle caps, foil, etc., comprising

a probe containing an induction coil;

a non-bridge type resonating circuit including said coil and a capacitor;

an oscillator which during the discriminating mode provides a driving signal which has a predetermined frequency that is significantly higher than the natural resonance frequency of said resonating circuit;

means coupling the oscillator to the resonating circuit through isolation means which prevent feedback from the resonating circuit to the oscillator so that the frequency of the driving signal remains constant during the discriminating mode;

said resonating circuit being driven by the driving signal so that it provides three different types of output signals having characteristic amplitudes, namely,

a. a first output signal having a predetermined amplitude when the probe is remote from a metal object,

b. a second output signal having an amplitude greater then the amplitude of the first output signal when the probe is proximate a metal object having an effect on the electrical properties of the coil generally similar to that of an object such as a coin like a penny,

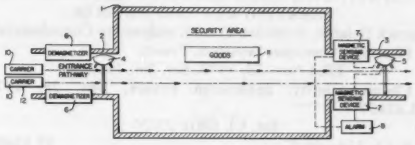
c. a third output signal having an amplitude about the same as or less than the amplitude of the first output signal when the probe is proximate a metal object having an effect on the electrical properties of the coil generally similar to that of junk objects such as a pull tab, bottle cap, foil, etc., and

means responsive to the second output signal for providing an indication that the probe is proximate a metal object such as a coin.

## 3,896,372
## MAGNETIC SENSING DETECTION SYSTEM AND METHOD

**Emmanuel M. Trikilis, 170 Maplewood Ave., Columbus, Ohio**

**Continuation of Ser. No. 745,729, July 18, 1968, abandoned. This application Dec. 28, 1970, Ser. No. 102,224**
**Int. Cl. G01r** *33/00*
**U.S. Cl. 324—41** **20 Claims**




1. A method for preventing the pilferage of goods comprising

a. providing a security area having an entrance pathway and an exit pathway;

b. actively supplying said goods located in the security area with a detectable magnetic field;

c. forming a demagnetizing zone in said entrance pathway;

d. demagnetizing any items having a detectable magnetic field, passing through said entrance;

e. forming a magnetic sensing zone in said exit pathway;

f. sensing the detectable magnetic field of any of said goods passing through the exit; and

g. preventing removal of said goods from the security area.

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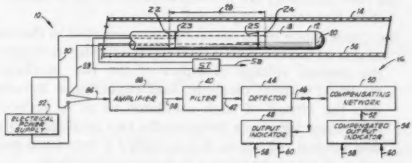
## 3,896,373
## METHOD AND APPARATUS FOR DETERMINING CROSS-SECTIONAL AREA OF A BLOOD CONDUIT AND VOLUMETRIC FLOW THERETHROUGH

**Leon W. Zelby, Norman, Okla., assignor to Paul D. Stein, Oklahoma City, Okla., a part interest**

**Filed Nov. 30, 1972, Ser. No. 310,872**
**Int. Cl. G01r** *27/00*
**U.S. Cl. 324—57 R** **7 Claims**




1. Apparatus for determining parameters of a fluid flowing through a conduit or the like comprising:

means for insertion within the conduit;

a pair of electrodes, each electrode secured to the means for insertion within the conduit and the pair of electrodes spaced apart a predetermined distance;

electrical power source means connected to the pair of electrodes impressing a predetermined electrical energy therebetween;

circuit means electrically connected to the electrodes of the pair of electrodes measuring and determining the voltage drop between the electrodes of the pair of electrodes impressed with the predetermined electrical energy and providing an output indication indicative of the measured and determined voltage drops, the measured and determined voltage drop being indicative of the internal cross-sectional area of the conduit generally between the electrodes;

output indicator means, having programmed therein the distance between the electrodes, receiving the measured and determined voltage drop between the electrodes,

receiving a provided input signal indicative of the fluid conductivity, receiving the impressed predetermined electrical energy between the electrodes, and providing an output indication indicative of the internal cross-sectional area of the conduit.

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**3,896,374**

## METHOD OF ANALOG MEASUREMENT OF A CAPACITANCE AND A CAPACITANCE METER FOR CARRYING OUT SAID METHOD

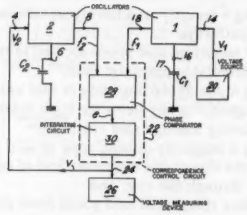
**Patrick Delafon, Seyssinet, France, assignor to Commissariat a l'Energie Atomique, Seyssinet, France**

**Filed Nov. 23, 1973, Ser. No. 418,300**

**Claims priority, application France, Nov. 29, 1972, 72.42467**

**Int. Cl. G01r** *27/26*

**U.S. Cl. 324—60 C** **17 Claims**



**1.** A method of analog measurement of a capacitance and/or a variation of capacitance in which use is made of two electric oscillators whose frequency is dependent on a capacitance connected thereto and in which the unknown capacitance is connected in the circuit of one of the oscillators, wherein:

two oscillators are selected so as to have a frequency which is dependent both on the capacitance introduced in their circuit and on a control voltage, said capacitance being independent of said control voltage,

the two oscillators are initially adjusted so as to ensure that their frequencies are equal,

the capacitance to be measured is connected in the circuit of one of the oscillators, thereby modifying its frequency, the control voltage of either of the two oscillators is modified without changing said capacitance introduced into the circuit of such oscillator so as to reduce the frequency difference between the two oscillators to zero, said control voltage as thus modified is measured and the value of said capacitance is deduced therefrom.

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**3,896,375**

## SYSTEM FOR MONITORING AND INDICATING PEAK VALUES OF A TIME VARYING SIGNAL

**Philippe Trolliet, Montreal, Canada, assignor to Her Majesty the Queen in Right of Canada as represented by the Secretary of State, Ottawa, Canada**

**Filed Feb. 6, 1974, Ser. No. 439,919**

**Int. Cl. G01r** *19/16, 13/20*

**U.S. Cl. 324—103 P** **9 Claims**

**1.** A system for monitoring and indicating peak values of a time varying signal comprising:

an input amplifier for receiving and amplifying said signals;

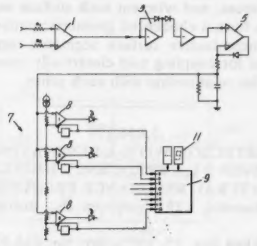
rectifying means, fed from said input amplifier and providing a rectified output;

peak detector means, receiving said rectified output and retaining peak values of said rectified output and providing said peak values at its output;

a voltage source in series with a potential divider having a plurality of output terminals for providing a different reference value at each said output terminal;

comparator means comprising a plurality of differential amplifiers, each differential amplifier having a first input terminal and a second input terminal and a first output terminal;

said peak detector means output being connected to all of said first input terminals;



a different one of said output terminals of said potential divider being connected to a different one of each of said second input terminals;

the first output terminal of said differential amplifiers providing a display driving signal; and

display means comprising a numerical display for indicating the highest peak value attained in a series of observations, and a moving dot display for indicating ongoing peak values in said series.

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**3,896,376**

## CIRCUIT ARRANGEMENT FOR TESTING INSULATION BY PARTIAL DISCHARGE TECHNIQUE

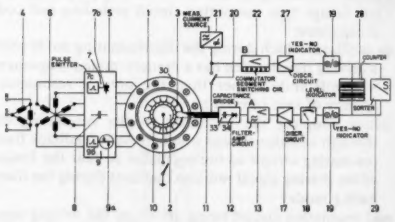
**Edgar Sinniger, Zurich, Switzerland, assignor to Micagil A.G., Zurich, Switzerland**

**Filed Dec. 12, 1972, Ser. No. 314,274**

**Claims priority, application Germany, Dec. 17, 1971, 2162896**

**Int. Cl. G01r** *31/00, 31/06*

**U.S. Cl. 324—158 MG** **4 Claims**



**1.** Apparatus for testing the insulation of a commutator type armature winding and for also separately checking the resistance of the winding which comprises, for insulation testing, an inductor-stator provided with a multi-coil winding and within which the armature is mounted in a non-rotative manner, means producing from test voltage pulses a rotary magnetic field within said inductor-stator including means for sequentially energizing said coils with corresponding test voltage pulses each of which has the configuration of a damped sinusoidal oscillation and which serve to induce corresponding voltage pulses in different portions of the armature winding, contact means engaged with the commutator segments and which connect the different portions of the armature winding with an active filter unit which serves to separate the high-frequency partial discharge components from the

fundamental of the damped sinusoidal oscillation, and a discriminator connected to the output of said filter unit for determining whether or not the insulation on the armature winding is satisfactory; and which comprises for resistance testing, a test voltage source connected to successive pairs of the commutator segments through said contact means for effecting corresponding flows of test current through the corresponding parts of the armature winding, means for measuring the magnitude of the test currents which are indicative of the resistance of the winding parts, and a second discriminator connected to the output of said measuring means for determining whether or not the armature winding parts have satisfactory resistance values.

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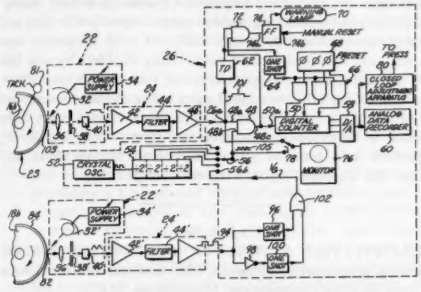
## 3,896,377
## PRINTING PRESS INSTRUMENTATION

**James Ivor Richardson, Montville, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio**

**Filed Jan. 2, 1974, Ser. No. 430,196**
**Int. Cl. G06m** *3/02*; **G01p** *3/12*
**U.S. Cl. 324—161** **22 Claims**



1. In a printing press having at least two rotatable members, apparatus for making measurements regarding a first rotatable member comprising means for producing a first position-indicating signal when said first member arrives at a first predetermined position; first means for generating a first train of successive clock signals at equally spaced successive times; means for producing a second position-indicating signal when said first member arrives at a second predetermined position including means for ending said first train of signals thereupon; second means for generating a second train of successive signals upon the respective passage of equal successive increments of angular travel of a second rotatable member; means for ending said second train when said second member arrives at a predetermined position; means for selecting one of said first and second means of generating successive signals to provide selectively one of said first and second trains of signals; and means for counting the successive signals of said selected train occurring between said first position-indicating signal and the end of said selected train to produce a final count.

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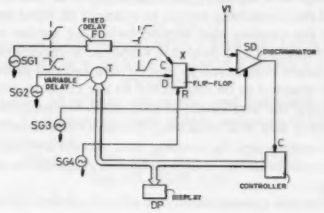
## 3,896,378
## APPARATUS FOR THE MEASUREMENT OF SHORT TIME INTERVALS

**John Bedford, Wargrave, England, assignor to Ferranti Limited, Hollinwood, England**

**Filed Oct. 26, 1973, Ser. No. 409,878**
**Claims priority, application United Kingdom, Oct. 28, 1972, 49796/72**
**Int. Cl.**[2] **G04F** *8/00*, *10/00*
**U.S. Cl. 324—188** **12 Claims**

1. Apparatus for the measurement of short time intervals representing the inherent time delays in semiconductor circuits, comprising two signals sources operable to apply input signals to a circuit under test, time delay means operable to apply a time delay to one of said two input signals relative to the other of said two input signals, control means operable to sample the output of the circuit under test at a rate not greater than the repetition rate of the input signals and to develop an output for varying the time delay inserted by said time delay



means in a manner determined by the said output, display means operable to indicate the duration of the inserted time delay in response to said output and means for applying the output of said control means to said time delay means.

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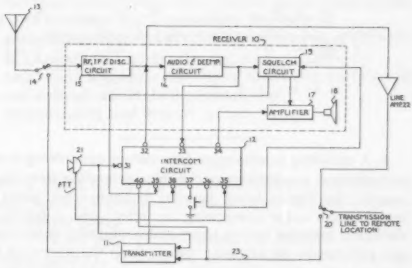
## 3,896,379
## INTERCOM CIRCUIT FOR A RADIO TRANSMITTER AND RECEIVER

**Robert A. Voss, Lynchburg, and Larry H. Wohlford, Rustburg, both of Va., assignors to General Electric Company, N.Y.**

**Filed June 10, 1974, Ser. No. 477,968**
**Int. Cl. H04b** *1/44*
**U.S. Cl. 325—21** **2 Claims**



1. Intercom apparatus for use with a radio transmitter and microphone and a radio receiver and speaker at a station location connected by a transmission line to a remote location, said intercom comprising:

a. means adapted to be connected in series with the audio portion of the radio receiver for deriving the audio signals from the demodulator of said radio receiver at a first terminal and for supplying audio signals to the amplifier of said radio receiver at a second terminal;

b. means adapted to be connected to the transmission line for deriving audio signals therefrom at a third terminal and for supplying audio signals thereto at a fourth terminal;

c. first switching means having an input connected to said first terminal, an output connected to said second terminal, and a control terminal;

d. second switching means having an input connected to said third terminal, an output connected to said second terminal, and a control terminal;

e. a control circuit having a plurality of inputs and having an output;

f. means connecting said control circuit output to said control terminals of said first and second switching means for causing said first switching means to disconnect its input

and output and for causing said second switching means to connect its input and output in the absence of signals at said control circuit inputs;

g. means connected to one of said control circuit inputs and adapted to be connected to said radio receiver for sensing receipt of a signal by said radio receiver and for causing said first switching means to connect its input and output and for causing said second switching means to disconnect its input and output in response to receipt of a signal;

h. means connected to one of said control circuit inputs and adapted to be connected to the radio transmitter for sensing the activation of said radio transmitter, and for causing said first switching means to disconnect its input and output and for causing said second switching means to connect its input and output in response to an activation;

i. and means connected to one of said control circuit inputs and adapted to sense operation of the microphone at said station location for causing said first switching means to disconnect its input and output, for causing said second switching means to disconnect its input and output, and for connecting said microphone to said fourth terminal in response to the operation of said microphone.

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**3,896,380**

## RADIATING LINE TRANSMISSION SYSTEM

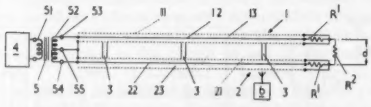
**David James Reginald Martin, London, England, assignor to Coal Industry (Patents) Ltd., London, England**

**Filed May 11, 1973, Ser. No. 359,341**

**Claims priority, application United Kingdom, May 26, 1972, 24967/72**

**Int. Cl. H04b** *3/00*

**U.S. Cl. 325—28** **5 Claims**




1. A radiating transmission line system comprising a source of radiation, a pair of coaxial cables extending from the said source, the cables being parallel to each other along their length, each cable comprising an inner core, a surrounding dielectric material and an apertured continuous outer conductor, and means for applying energy from the source of radiation to both cables whereby the energy in one cable is in phase displacement to the energy in the other cable, wherein the said means for applying energy from the source of radiation to both cables comprises a transformer interposed between the said source of radiation and the pair of coaxial cables, the transformer having an output winding connected to the said cables, the outer conductors of the cables being connected to a common point on the output winding and the inner cores of the cables being connected respectively one to each end of the output winding.

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**3,896,381**

## RELIABLE RADIO-TELETYPE CODING

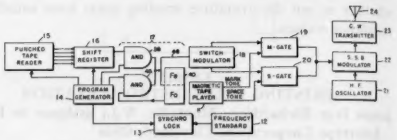
**John M. Wozencraft, Boston, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Nov. 2, 1960, Ser. No. 66,886**

**Int. Cl. H04b** *15/00*

**U.S. Cl. 325—32** **9 Claims**

1. A communications system for transmitting teletype information comprising: a magnetic tape player having a multichannel output, a program generator for developing timing pulses having a plurality of outputs and controlled by one of said output channels of said magnetic tape player in which control information has been pre-recorded, a teletype tape reader controlled by timing pulses from said program generator, a multiple stage shift register connected to the output of said tape reader for temporarily storing data received from said tape reader, said shift register being controlled by timing pulses from said program generator to commutate said data into binary code trains of time-sequential pulses, a parity counting circuit for receiving said time-sequential pulse trains and adding an appropriate parity checking pulse to each of said trains, a switch modulator having first and second outputs




controlled by said time-sequential pulses and said parity checking pulses, first and second gates connected to first and second tone channels, respectively, of said magnetic tape player, said first and second gates being enabled by said first and second outputs, respectively, of said switch modulator, the tones passed by one of said gates being chosen to represent a mark and the tones passed by the other of said gates being chosen to represent a space in said binary code to thereby represent said train of pulses as a sequence of tones, and means for transmitting said sequence of tones.

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**3,896,382**

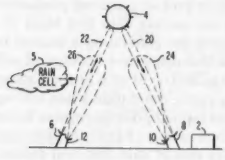
## PRECIPITATION ATTENUATION DETECTION SYSTEM

**Bertram Magenheim, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.**

**Filed Nov. 17, 1972, Ser. No. 307,725**

**Int. Cl. H04b** *7/02*

**U.S. Cl. 325—56** **6 Claims**




1. In a satellite communications system including a plurality of earth stations, a precipitation attenuation detection system comprising:

means associated with an earth station for generating a pair of communications beams traversing the space between the earth station and at least one satellite over separate communications links, only one of said beams being active to carry communications signals at any time, the other beam being dormant,

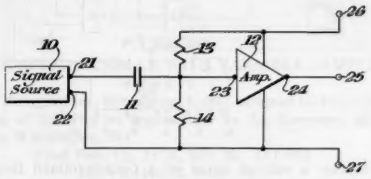
precipitation detecting means for detecting precipitation in a region above said earth station, said region including an area which surrounds the beam width of said active communications beam, and

switch means, responsive to the detection of precipitation by said detecting means, for switching the communications signals to the dormant communications beam, the beam previously carrying communications signals becoming dormant.

## 3,896,383
## A.C. COUPLING NETWORK

Alberto Bilotti, Buenos Aires, Argentina, and Ronald W. Lutz, Holden, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed June 19, 1973, Ser. No. 371,421
Int. Cl. H04b 1/16
U.S. Cl. 325—347 4 Claims

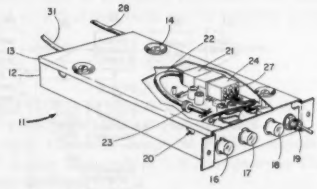



1. A method for coupling an electrical signal from a signal source to the input of an amplifier comprising:
a. providing a signal source having a low output impedance;
b. providing an amplifier circuit with a high input impedance;
c. connecting a d.c. power supply containing an a.c. ripple to said amplifier for providing power thereto;
d. connecting a coupling capacitor between said output of said signal source and said input of said amplifier; and
e. connecting a high impedance d.c. bias circuit directly to and powered by said d.c. power supply for the purpose of providing a bias at said input of said amplifier, said bias circuit, said amplifier and said signal source having a common reference ground connection, said coupling capacitor having a low impedance at the lowest signal frequency to be amplified and having a low impedance at the frequency of ripple in said bias circuit, wherein each said high impedance is at least ten times greater than any of said low impedances, such that any ripple currents present in said bias circuit are substantially shorted to ground through said coupling capacitor and said output impedance of said signal source, and such that essentially only the amplified signal appears at the output of said amplifier.

## 3,896,384
## DUAL MOUNT ELECTRONIC DEVICE

Claude L. Henderson, Camby, Ind., assignor to General Aviation Electronics, Inc., Indianapolis, Ind.

Filed Oct. 5, 1973, Ser. No. 403,876
Int. Cl. H04b 1/08
U.S. Cl. 325—352 9 Claims

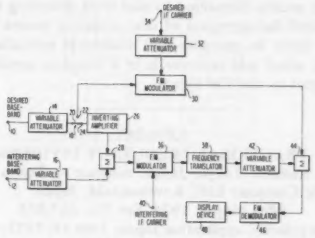


1. An electronic device adaptable for both remote mounting and panel mounting comprising:
a package having an aperture including first and second electronic circuit sections;
a connector assembly having a first portion which is coupled to the first circuit section and positioned within the package and having a second portion; and
wire means for coupling the second connector portion to the second circuit section and for positioning the second connector portion outside the package when the first and second connector portions are disconnected, the wire means and the second connector portion being positioned inside the package through said aperture when the first and second connector portions are connected.

## 3,896,385
## METHOD AND INSTRUMENT FOR MEASURING INTERFERENCE BETWEEN ANGLE MODULATED SYSTEMS

Nand Kishore M. Chitre, Rockville, and Benjamin Anthony Pontano, Gaithersburg, both of Md., assignors to COMSAT, Washington, D.C.

Filed Jan. 29, 1974, Ser. No. 437,562
Int. Cl. H04b 1/00
U.S. Cl. 325—363 8 Claims

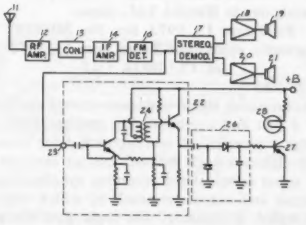


1. A method of measuring the interference component resulting from an interfering carrier angle modulated with baseband $\phi_2(t)$ interfering with a desired carrier angle modulated with baseband $\phi_1(t)$ comprising the steps of
a. angle modulating said interfering carrier with a baseband $\phi(T)$ where $\phi(T) + \phi_2(t) - \phi_1(t)$,
b. combining said angle modulated interfering carrier with said desired carrier, unmodulated, and
c. demodulating said desired carrier.

## 3,896,386
## TUNING INDICATOR WITH NOISE SIGNAL DETECTOR

Mitsuo Ohsawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 18, 1972, Ser. No. 290,178
Claims priority, application Japan, Sept. 20, 1971, 46-73245
Int. Cl. H04b 1/16
U.S. Cl. 325—398 4 Claims




1. A tuning indicator for use with an FM radio receiver comprising an IF circuit and an FM detector, said indicator comprising:
A. a noise signal selector coupled to said FM detector to receive signals therefrom and tuned to a predetermined frequency outside of the band of signal frequencies from said detector to extract a noise signal of said predetermined frequency;

B. a plurality of illuminating devices;

C. a plurality of level detecting circuits connected to said noise signal selector to be energized by said noise signal, each of said level detecting circuits having a different response level and comprising an individual switching means connected to a corresponding one of said illuminating devices whereby each of said illuminating devices will be actuated at a predetermined level of said noise signal corresponding to the relationship between the frequency to which said receiver is tuned and an incoming signal;

D. additional visual indicating means;

E. actuating means connected to said IF circuit, said actuating means being responsive to an IF signal corresponding to a received FM signal and being connected to said additional visual indicating means to thereby energize said additional indicating means in response to reception of said FM signal; and

F. gate means connected to said level detecting circuits to control the operation of said actuating means to permit the latter to energize said additional indicating means only when said receiver is in a tuned-in condition with respect to said FM signal.

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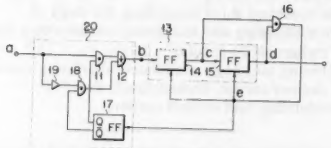
**3,896,387**

## FRACTIONAL FREQUENCY DIVIDERS

**Naoyuki Kokado, Tokyo, Japan, assignor to Tokyo Shibaura Electric Company Ltd., Kawasaki-shi, Japan**

**Filed May 8, 1974, Ser. No. 467,855**
**Claims priority, application Japan, June 19, 1973, 48-68288**
**Int. Cl. H03k** *21/00*
**U.S. Cl. 328—39** **22 Claims**




**14.** A freqeuncy divider which comprises a counter circuit consisting or one or more cascade binary counter units and supplied with an input clock pulse; a device for receiving an output clock pulse from the counter circuit and reversing the polarity of said input clock pulse.

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**3,896,388**

## SYNCHRONIZING SIGNAL GENERATOR DEVICE

**Yoshikazu Hatsukano, and Shunji Shimada, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan**

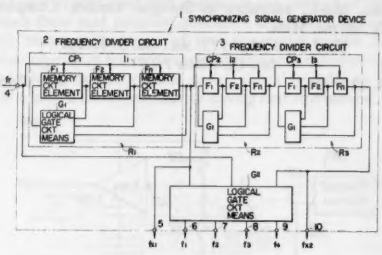
**Filed June 13, 1973, Ser. No. 369,416**
**Claims priority, application Japan, June 23, 1972, 47-6242**
**Int. Cl.[2] H03K** *1/17*
**U.S. Cl. 328—63** **3 Claims**

**1.** A synchronizing signal generator device comprising:

at least a first and a second ring counter, each of which includes a plurality of synchronous delay type memory circuit elements each memory circuit element having a clock input terminal for receiving synchronizing pulses and input and output terminals by which said elements are coupled in cascade; and logic gate circuit means having a plurality of input terminals coupled to said output terminals of a plurality of said elements and an output terminal coupled to the input terminal of the first element;

means for applying a reference signal in common to each clock input terminal of said first ring counter in the form of synchronizing pulses; and

means for connecting the output terminal of the last element of said first ring counter in common to each clock input terminal of said second ring counter in the form of synchronizing pulses;


1 SYNCHRONIZING SIGNAL GENERATOR DEVICE
2 FREQUENCY DIVIDER CIRCUIT
3 FREQUENCY DIVIDER CIRCUIT
MEMORY CKT ELEMENT
LOGICAL GATE CKT MEANS

whereby a second signal of a predetermined frequency different from the frequency of said reference signal and having substantially no delay over said reference signal is derived from said second ring counter.

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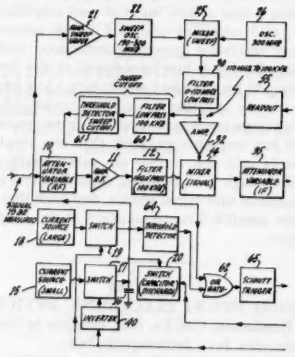
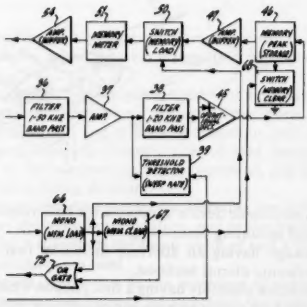
**3,896,389**

## SENSITIVE WIDE BAND VOLTMETERS

**Philip Basse, Freeport, N.Y., assignor to Comstron Corporation, Richmond Hill, N.Y.**

**Division of Ser. No. 243,224, April 12, 1972, Pat. No. 3,810,015. This application Dec. 17, 1973, Ser. No. 425,109**
**Int. Cl. H03k** *5/20*
**U.S. Cl. 328—151** **6 Claims**




**1.** Apparatus for measuring the amplitude of an AC signal of the type including a down-converter for producing another

signal indicative of said AC signal at a lower frequency in combination therewith apparatus for indicating the magnitude of said signal, comprising:

a. means responsive to said another signal for providing a control signal when said signal is within a predetermined frequency range,

b. memory means coupled to said means and operative to store a value indicative of said another signal during the presence of said control signal.

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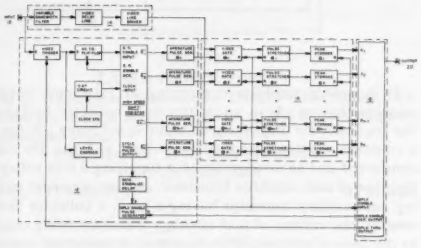
## 3,896,390
## HIGH-SPEED SAMPLER WITH VARIABLE SAMPLE RATE

**Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 11, 1974, Ser. No. 441,081**
**Int. Cl.[2] H03K** *5/00, 5/18*
**U.S. Cl. 328—151** **7 Claims**



1. A pulse sampler wherein the pulse to be processed is partitioned into segments and the segments are separately stored for retrieval to provide a composite output, comprising:

an input for receiving at least one electrical pulse;

means coupled to said input for electronically partitioning said pulse into a plurality of nominally equal valued, sequential segments;

means coupled to said input for electronically delaying and preparing said pulse for processing;

means having a plurality of electrical channels equal in number to said plurality of segments, coupled to both said partitioning means and said delaying means for electronically sampling said pulse, wherein each channel samples that portion of the pulse that is coupled thereto simultaneously with a said segment;

means coupled to each channel for separately storing the maximum value of each sample; and

means for electronically combining said maximum values from time to time to nominally reconstruct the shape of said pulse such that said pulse can be leisurely examined in detail.

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## 3,896,391
## HIGH SPEED VIDEO DIVIDER WITH COMPENSATION FOR NON-LINEAR FUNCTIONS

**Frank M. Pelton, Clarence; Joseph A. Bruder, Snyder, and Thomas F. Leney, Elma, all of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.**

**Filed Feb. 11, 1974, Ser. No. 441,527**
**Int. Cl. G06g** *7/16*
**U.S. Cl. 328—161** **8 Claims**

1. A wide - bandwidth divider for dividing signals over a wide frequency range and for compensating a resulting signal including:

means for supplying a first input signal;

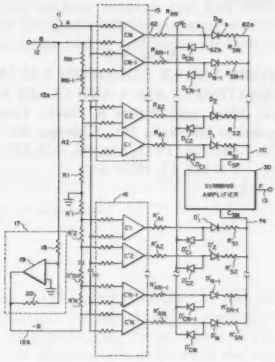
means for supplying a second input signal;

first comparator means including a plurality of comparators;

second comparator means including a plurality of comparators equal to the number of comparators in said first comparator means;

first resistor means for dividing said second input signal and supplying a divided second input signal to each comparator in said first comparator means;

inverting circuit means for changing the sign of said second input signal to provide an inverted second input signal;



second resistor means for dividing said inverted second input signal and supplying a divided inverted second input signal to each comparator in said second comparator means;

means for supplying said first input signal to each comparator in said first and second comparator means;

circuit means coacting with said first and second comparator means, respectively, to produce a signal which is an indication of the polarity and magnitude of the value of said first signal divided by said second signal.

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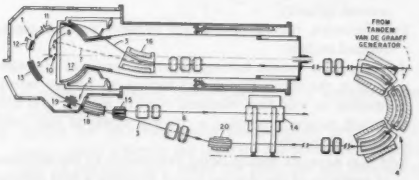
## 3,896,392
## ALL-MAGNETIC EXTRACTION FOR CYCLOTRON BEAM REACCELERATION

**Ed D. Hudson, Knoxville, and Merrit L. Mallory, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.**

**Filed Feb. 21, 1974, Ser. No. 444,458**
**Int. Cl.[2] H05H** *7/04, 7/10, 13/00*
**U.S. Cl. 328—234** **4 Claims**




1. In an isochronous cyclotron provided with a magnetic field and a beam deflection assembly for separating a first extracted beam from the circulating beam of said cyclotron, said assembly including a thin current-carrying sheet arcuate conductor as the septum of said beam deflection assembly, means for adjustably holding fast the end points of said sheet conductor, means for passing a desired and selected amount of current through said sheet conductor, and means for providing a compensating magnetic field in the vicinity of said sheet conductor, said conductor assuming the same shape as

the path of a charged particle in said extracted beam as a result of forces induced in said current-carrying conductor by the magnetic field of said cyclotron, the improvement comprising a 180° bending magnet positioned for receiving said extracted beam and thus turning it around, said bending magnet's position also being such as to direct said beam for reinjection back into said cyclotron for a second pass therethrough, thereby substantially increasing the final energy thereof upon its second extraction from said cyclotron by said deflection assembly.

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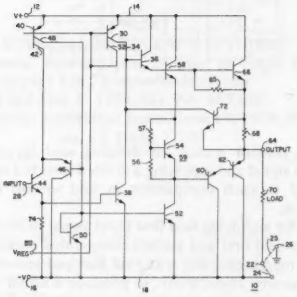
## 3,896,393
## MONOLITHIC POWER AMPLIFIER CAPABLE OF OPERATING CLASS A AND CLASS AB

**David L. Cave, Mesa, and Walter R. Davis, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.**

**Filed Dec. 26, 1973, Ser. No. 428,519**
**Int. Cl. H03f** *3/04*
**U.S. Cl. 330—22** **10 Claims**



1. A class AB-class A amplifier circuit suitable for providing an output signal having a maximized excursion across a load in response to an input signal having portions of first and second polarities, including in combination:

first electron control means connected to the load, said first electron control means being rendered conductive in response to the portions of the input signal of the first polarity to source current to the load;

second electron control means coupled to the load, said second electron control means being rendered conductive in response to the portions of the input signal of the second polarity;

bias network means connected to said second electron control means;

driver circuit means having an input terminal adapted to receive the input signal and having an output terminal coupled to said first electron control means, said driver circuit means providing a driving signal at said output terminal thereof;

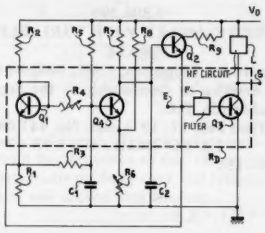
said bias network means being responsive to the magnitude of portions of the driving signal crossing a first threshold to render said second electron control means non-operative so that said first electron control means can drive the output signal across the load to a predetermined level and thereby develop the output signal having the maximized excursion; and

buffer means being connected between said bias network means, said driver circuit means and said first electron control means for severely limiting distortions in the output signal thereof as said bias network means renders said second electron means non-operative.

## 3,896,394
## ARRANGEMENT FOR COMPENSATING THE TEMPERATURE DRIFT OF A POWER AMPLIFIER

**Jose Marie Baro, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Sept. 20, 1974, Ser. No. 507,996**
**Claims priority, application France, Sept. 25, 1973, 73.34297**
**Int. Cl.² H03F** *3/04*
**U.S. Cl. 330—23** **3 Claims**



1. A power amplifier comprising at least one amplifier transistor having a base, an emitter and a collector, said amplifier transistor for amplifying an input signal being arranged in a common emitter configuration at least as far as the bias is concerned and an arrangement for supplying a bias voltage to the base of said amplifier transistor, said arrangement including: an auxiliary transistor having a base, a collector and an emitter, the emitter of said auxiliary transistor being coupled to the base of said amplifier transistor; a regulating transistor having a base, a collector and an emitter, the collector of said regulating transistor being coupled to the base of said auxiliary transistor; a resistor inserted between the base of said regulating transistor and the emitter of said auxiliary transistor; a further transistor, having the same characteristics as said regulating transistor and having a base, a collector and an emitter, the emitter of said further transistor being coupled to the emitter of said auxiliary transistor; a variable resistor inserted between the base of said regulating transistor and the base of said further transistor, the base and collector of said further transistor being coupled; and means for adjusting the emitter voltage of said regulating transistor; said amplifier transistor, said regulating transistor and said further transistor being assembled on one and the same radiator.

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## 3,896,395
## LINEAR AMPLIFICATION USING QUANTIZED ENVELOPE COMPONENTS TO PHASE REVERSE MODULATE QUADRATURE REFERENCE SIGNALS

**Donald Clyde Cox, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed July 18, 1974, Ser. No. 489,760**
**Int. Cl.² H03F** *3/60*
**U.S. Cl. 330—53** **10 Claims**

1. A device for amplifying a high frequency bandpass analog input signal having both amplitude and phase variations and having a given maximum amplitude comprising:

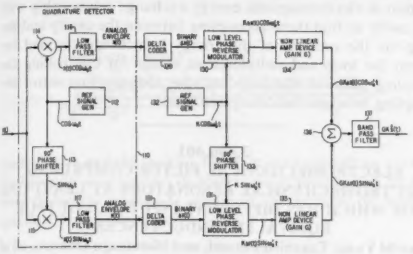
quadrature detector means for producing from the input signal a pair of variable amplitude intelligence containing envelopes each said envelope being derived from different ones of the quadrature signal components of the input signal;

means for producing from each variable amplitude envelope a bitstream approximation whose weighted time average is a replica of the respective envelope;

means for generating two quadrature reference signals of equal amplitude;

means for phase reverse modulating the two quadrature reference signals respectively with ones of the two bit-

stream approximations to produce two constant envelope signals of amplitude greater than the maximum amplitude of the input signal;



means for combining the two constant envelope signals to produce a linearly amplified replica of the original analog input signal.

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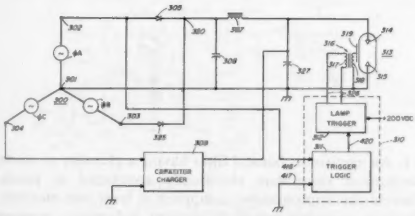
## 3,896,396
## LASER POWER SUPPLY

**David R. Whitehouse, Weston, and David W. Hartshorn, Framingham, both of Mass., assignors to Raytheon Company, Lexington, Mass.**

**Filed May 14, 1973, Ser. No. 359,827**
**Int. Cl. H01s** *3/09*
**U.S. Cl. 331—94.5 PE** **11 Claims**



1. In combination:
a laser active medium;
noncoherent light producing means for pumping said laser active medium to produce a coherent beam of radiation therefrom, said noncoherent light producing means producing said noncoherent light in response to an electrical current flowing through said noncoherent light producing means; and
uncontrolled rectifying means, said rectifying means coupling said source of noncoherent light to a source of alternating electrical power, current to said noncoherent light producing means flowing from said source of alternating power through said uncontrolled rectifying means with no substantial energy storing means located therebetween.

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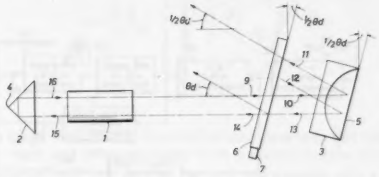
## 3,896,397
## ACOUSTO-OPTICALLY Q-SWITCHED LASER

**Michiel de Wit, Dallas, and Roddy Fro Hotz, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 12, 1973, Ser. No. 424,115**
**Int. Cl. H01s** *3/11*
**U.S. Cl. 331—94.5 Q** **8 Claims**

1. An acousto-optically Q-switched laser comprising:
a. a laser cavity including a lasing medium, first reflecting means mounted substantially perpendicular to the longitudinal axis of said lasing medium and spaced from one end thereof for reflecting radiation from said lasing medium back to said lasing medium, feedback reflecting means spaced from the other end of said lasing medium, and means for optically pumping said lasing medium to produce a non-uniform population inversion density in said lasing medium;
b. an acousto-optic switch within said laser cavity, said acousto-optic switch being mounted along and tilted at a preselected angle with respect to the longitudinal axis of said lasing medium between said first reflecting means and said feedback reflecting means and being spaced from the other end of said lasing medium for deflecting



a portion of the radiation emitted by said lasing medium;
c. a transducer for introducing acoustic energy into said switch, said transducer being mounted with respect to said switch such that the gradient of the envelope of the acoustic energy introduced into and propagated through said switch approximates the gradient of the non-uniform population inversion directly in said lasing medium; and
d. said feedback reflecting means being positioned along and tilted at a preselected angle with respect to the longitudinal axis of said lasing medium related to the path to be taken by the deflected portion of radiation for reflecting said deflected portion of radiation back to said switch.

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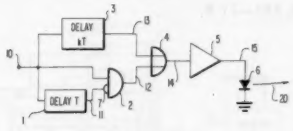
## 3,896,398
## DRIVER CIRCUIT FOR PULSE MODULATION OF A SEMICONDUCTOR LASER

**Atsufumi Ueki, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed Nov. 5, 1973, Ser. No. 413,152**
**Claims priority, application Japan, Nov. 10, 1972, 47-113208**
**Int. Cl. H01s** *3/09*
**U.S. Cl. 332—7.51** **7 Claims**

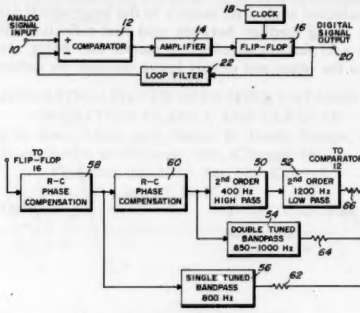


1. A pulse modulation driver circuit for a semiconductor laser, comprising:
a. means for receiving input pulse signals composed of binary codes wherein the code for the presence of output light of the laser is 1 while the code for the absence of light is 0;
b. means connected to said receiving means for discriminating among the input pulse signals to detect the occurrence of a pulse having a code of 1 following a pulse having a code of 0;
c. means connected to said receiving means and controlled by said discriminating means for modulating the detected pulse to increase the average driving current to said laser whereby the intensity of an output light pulse of said semiconductor laser corresponding to a pulse signal having a code of 1 is independent of a preceding pulse signal.

## 3,896,399
## LOOP FILTER FOR DELTA MODULATOR

James A. McDonald, Buffalo Grove, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed July 19, 1973, Ser. No. 380,784
Int. Cl. H03k 13/22
U.S. Cl. 332—11 D 20 Claims

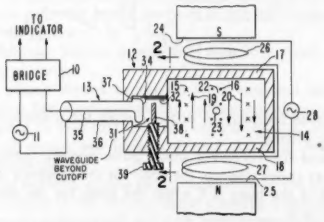



1. For use in a delta modulator for converting an analog signal having a predetermined band of frequencies into a digital signal having a predetermined clock rate greater than twice the highest frequency in said predetermined band, a loop filter coupled between an input and an output of the modulator, said filter comprising; means for receiving said digital signal connected to the output of the modulator, means coupled to said receiving means for filtering said digital signal to attenuate the frequencies of said digital signal lying above and below said predetermined band relative to the frequencies within said predetermined band to provide a band limited analog signal, and means connected to the input of the modulator for applying the band limited analog signal thereto.

## 3,896,400
## COAXIAL LINE TO MICROWAVE CAVITY COUPLING SECTION COMPRISING A WAVEGUIDE BEYOND CUTOFF

James Stewart Hyde, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 370,177, June 14, 1973, Pat. No. 3,828,244. This application Feb. 28, 1974, Ser. No. 446,843
Int. Cl. H01p 5/04, 5/08
U.S. Cl. 333—21 R 12 Claims

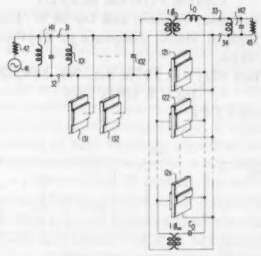



1. A variable coupler between a coaxial line and a microwave cavity for supporting electromagnetic energy at a frequency propagating in said line comprising a section connected to and opening into said cavity, said section being dimensioned so that it is a waveguide beyond cutoff for the frequency propagating in said line, a fixedly mounted planar loop in said section connected to be in energy exchange relationship with the energy propagating in said line and rigidly positioned so that its plane is substantially at right angles to a microwave magnetic field coupled into the cavity, an electromagnetic radiator for the energy, said radiator being positioned in the section, said radiator being only inductively coupled with said loop, said radiator being positioned in the section in electromagnetic energy exchange relationship with the cavity so that there is coupling between the cavity and the loop via the radiator of the energy inductively coupled between the loop and radiator, and means for controlling the coupling between the loop and the radiator to control the coupling between the cavity and line.

## 3,896,401
## ELECTROMECHANICAL FILTER COMPRISING ELECTROMECHANICAL RESONATORS AT LEAST ONE OF WHICH HAS DIFFERENT INPUT AND OUTPUT EQUIVALENT INDUCTANCES

Takeshi Yano; Takehiro Futami, and Mototsugu Ookura, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 26, 1973, Ser. No. 336,123
Claims priority, application Japan, Feb. 25, 1972, 47-19873
Int. Cl. H03h 7/10, 9/00
U.S. Cl. 333—72 6 Claims



1. An electromechanical filter having a plurality of electromechanical resonators electrically connected in parallel, wherein the improvement comprises at least one electromechanical resonator whose equivalent inductance measured from the input side and whose equivalent inductance measured from the output side are different, said at least one electromechanial resonator comprising a piece capable of being set into mechanical vibration in a predetermined mode, first and second piezoelectric ceramic pieces, and means for supplying electric power across each of said ceramic pieces, said ceramic pieces being attached to said piece over predetermined effective areas, respectively, so as to set said piece into said vibration when electric power is supplied thereto, said effective areas being different.

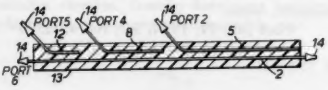
## 3,896,402
## DIELECTRIC WAVEGUIDE FILTERS

Lynden Ashbrooke Jackson, Suffolk, England, assignor to The Post Office, London, England

Filed Feb. 19, 1974, Ser. No. 443,429
Claims priority, application United Kingdom, Feb. 19, 1973, 7937/73
Int. Cl.[2] H01P 1/18, 1/20
U.S. Cl. 333—73 W 13 Claims

1. A dielectric waveguide filter assembly comprising in combination a dielectric medium, a plurality of dielectric waveguide regions totally immersed in said medium, each of said regions having an energy input port and an energy output port, a first of said dielectric waveguide regions having a first length that is spaced from and parallel to a first length of a second of said dielectric waveguide regions, the first lengths and the spacing therebetween permitting a transfer from one region to the other of energy lying in a specified frequency

band, the said second of said dielectric waveguide regions having a second length spaced from and parallel to a first length of a third of said dielectric waveguide regions, the second length, the first length of said second dielectric waveguide region and the spacing therebetween permitting a transfer between said second dielectric waveguide region to said third dielectric waveguide region of energy lying on another specified frequency band.

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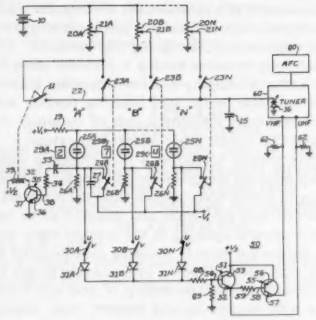
**3,896,403**

## TOUCH-TUNING SYSTEM FOR A TELEVISION RECEIVER

**John Ma, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.**

**Filed May 3, 1974, Ser. No. 466,593**
**Int. Cl.[2] H03J** *5/04, 1/04*
**U.S. Cl. 334—15** **3 Claims**




1. A touch-tuning system for a television receiver including an AFC circuit and being tunable over both the VHF and UHF frequency bands at each of a plurality of tuning positions comprising; a tuner including a varactor diode tuning element; a source of DC reference potential; a plurality of potentiometers individually located at respective ones of said tuning positions and each coupled across said source of DC reference potential, said potentiometers each having a movable tap; a tuning capacitor coupled to said varactor diode; viewer-operated momentary contact switch means selectively connecting said movable taps to said tuning capacitor for establishing the tuning voltage thereacross in accordance with the setting of the corresponding potentiometer; said momentary contact switch means including a two-pole mechanical switch at each said tuning location, one pole of each switch being connectable to said movable taps; a plurality of neon tube indicators, coupled to a voltage source through a common resistance for precluding energization of more than one of said indicators at the same time, respective ones of said plurality of indicators being individually located at each said tuning position; means, including said second pole on each said switch for selectively energizing said neon indicators by momentary operation of the switch at the corresponding tuning position; bandswitching means normally operating said tuner in said VHF frequency band; and a U/V bandswitch at each said tuning position for conditioning said bandswitching means for operating said tuner in said UHF frequency band.

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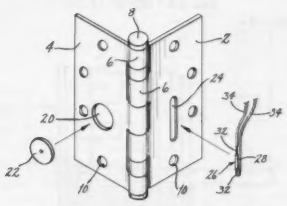
**3,896,404**

## MAGNETIC SWITCH HINGE

**Francis C. Peterson, St. Louis County, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.**

**Filed Feb. 4, 1974, Ser. No. 439,132**
**Int. Cl.[2] H01H** *53/06*
**U.S. Cl. 335—205** **9 Claims**



1. A hinge comprising: first and second generally flat hinge leaves, each leaf being provided with a recess therein which opens out of only one face of the leaf and extends only partially through the leaf with an integral portion of the leaf extending beyond the recess so that the opposite face of the leaf is not disrupted and the recess is invisible at that opposite face, means connecting the hinge leaves to enable them to swing relative to each other; a magnet contained substantially entirely within the recess in the first leaf and creating a magnetic field, and a switch contained substantially entirely within the recess of the second leaf, the switch containing overlapping elongated reeds, the longitudinal axes of which are substantially parallel to the faces of the second leaf, and being sensitive to the magnetic field created by the magnet, the magnet and switch being positioned in their respective leaves such that the magnet will acuate the switch and change the condition thereof in response to swinging movement of the one hinge leaf relative to the other hinge leaf.

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**3,896,405**

## SOLENOID VALVE WITH THREADED CORE TUBE

**Jude A. Pauli, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.**

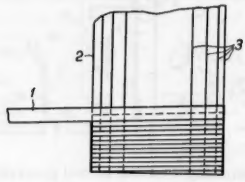
**Filed Sept. 3, 1974, Ser. No. 502,785**
**Int. Cl.[2] H01F** *3/00*
**U.S. Cl. 335—281** **7 Claims**

1. In a solenoid valve having a core tube and a top plug in an outer end of said core tube, said core tube having a thin, cylindrical side wall, the improvement comprising a screw thread form on a side surface of said top plug and at least one screw thread formed in said core tube side wall, said screw thread having an external aspect and an internal aspect, said external aspect being accessible to internally complementarily threaded nut means from the said outer end of said core tube, and the internal aspect of said screw thread engaging, formed on, and generally conforming to said screw thread form on said side surface of said top plug.

## 3,896,406
## SCREEN FOR CORE LEGS FOR TRANSFORMERS, REACTORS AND THE LIKE

**Olle Andersson, and Ellerth Ericsson, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektrika Aktiebolaget, Vasteras, Sweden**

**Filed Aug. 6, 1974, Ser. No. 495,112**
**Claims priority, application Sweden, Aug. 23, 1973, 73114639**
**Int. Cl.² H01F** *15/04*
**U.S. Cl. 336—84** **3 Claims**

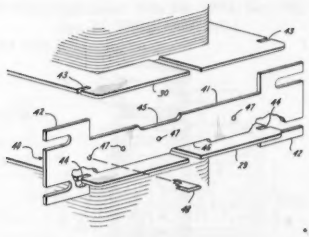



1. A core leg for transformers, reactors and the like formed of a plurality of magnetic sheets with a surrounding tape to prevent the occurrence of glow discharge at sharp corners and edges where there prevail inhomogeneous electric fields and to hold the core sheets together mechanically, said tape (1) comprising a backing having high mechanical strength and impregnated with an impregnant consisting essentially of an electrically semiconducting and thermosetting material, wound around the sheets with high mechanical tension and with overlapping so that a screen surrounding the core leg (2) is formed, said screen being cured by heat treatment and being quite stiff and having good mechanical and electrical contact with the core leg at least along the longitudinal edges (3) of the core leg.

## 3,896,407
## MAGNETIC CORE AND COIL DEVICE

**Clifton W. Long, San Marcos, Tex., assignor to Esquire, Inc., New York, N.Y.**

**Filed Oct. 7, 1974, Ser. No. 512,422**
**Int. Cl.² H01F** *15/10*
**U.S. Cl. 336—160** **4 Claims**

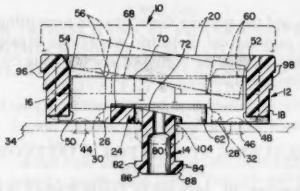



1. A device, comprising a magnetic core having side legs, a middle leg intermediate the side legs, end legs connecting the ends of the side and middle legs, and shunts extending between the middle leg and each side leg intermediate the end legs, a pair of coils each wound about a bobbin which is disposed about the middle leg of the core on opposite sides of the shunts, the bobbins having flanges on their adjacent ends, and a terminal strip extending between the flanges, each flange and the strip having parts which interfit to retain said strip in position between said flanges, said interfitting parts extending essentially parallel to axis of the middle leg of the core so as to be moveable into interfitting relation as the bobbins are assembled over the middle leg of the core.

## 3,896,408
## FUSE EJECTOR

**Lester R. Leidy, Jr., Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jan. 31, 1974, Ser. No. 438,370**
**Int. Cl.² H01H** *85/22, 85/54*
**U.S. Cl. 337—211** **5 Claims**




1. A fuse ejector/shroud member for use in association with a pair of spaced spring clip contacts for a cartridge type fuse, said clip contacts being mounted on a suitable support base, said member comprising:

a non-conductive shroud body member of a single piece construction and of a substantially rectangular configuration having side and end walls of sufficient height to be at least coextensive with the spring clip contacts;

said shroud body member having a partially open bottom with an integral bridging portion extending transversely between said side walls, said bridging portion and said side and end walls defining a pair of openings through which said clip contacts are adapted to extend;

said bridging portion including a fuse engaging surface, a mounting pedestal integral with said bridging portion and extending in a direction opposite from the direction of the extension of said side walls and adapted to be inserted through a suitable opening in the support base, and

mounting means for loosely securing said pedestal in said opening, said pedestal being of a suitable length to provide a loosely captive mounting of said ejector/shroud member with respect to said support base, whereby to permit a cartridge fuse to be inserted between said clip contacts when said ejector/shroud member is fully seated on said support base and whereby said fuse engaging portion of said bridging portion is operative to eject said mounted fuse from between said clip contacts when said shroud is lifted slightly from said support base.

## 3,896,409
## LIQUID LEVEL SENSOR FOR CORROSIVE BATHS

**Adolph L. Micheli, and Dennis F. Dungan, both of Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 18, 1974, Ser. No. 515,924**
**Int. Cl. H01c** *7/00*
**U.S. Cl. 338—28** **3 Claims**

1. A thermistor assembly for liquid level sensing applications involving corrosive liquids which is easily manufactured and which has a response time that is readily set during said manufacture, said assembly comprising:

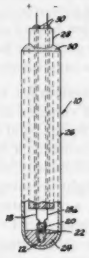
a thermistor element;

at least two electrically conductive wires attached to said thermistor element;

a corrosion resistant tube having a closed end portion with a wall thickness of about 0.5 – 3 mm wherein said tube provides protection for said thermistor from corrosive solutions whose liquid level is to be sensed while serving as a thermal conductor therebetween;

a lead alloy heat exchange member in the closed end portion of said tube and directly contacting the inner walls thereof;

a coating of sintered polytetrafluoroethylene particles between about 0.025 – 0.25 mm thick on said thermistor element and said conductor wires extending from said thermistor element, thereby forming a polytetrafluoroethylene coated thermistor subassembly; and



said polytetrafluoroethylene coated thermistor subassembly being immersed in said lead alloy heat exchange member at a predetermined spacing relative to the walls of said tube wherein the spacing therebetween determines the response of said thermistor element, said polytetrafluoroethylene coating providing an impervious barrier to said lead alloy heat exchange member and electrically insulating said conductor wires from said lead alloy heat exchange member.

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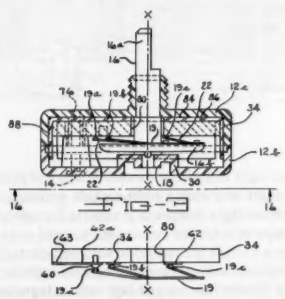
## 3,896,410
## ROTARY CONTROL

**Benjamin H. Matthews, Peninsula; Jules W. Rhine, Bedford, and Suresh K. Nangia, Bedford Heights, all of Ohio, assignors to Lucerne Products Inc., Hudson, Ohio**

**Filed Aug. 6, 1973, Ser. No. 386,230**
**Int. Cl. H01c** *9/08*
**U.S. Cl. 338—48** **20 Claims**

1. In a compact electrical energy control for controlling the magnitude of electrical energy input into an associated circuit

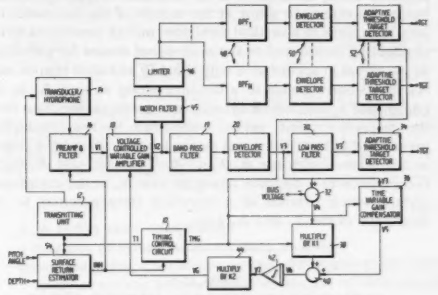


load comprising, a support, a circuit including printed circuit components disposed on said support, and an actuator comprising a member rotatable about an axis disposed substantially perpendicular to the plane of said support, said member having electrical contacts thereon adapted for engaging coaction with certain of said printed circuit components during rotatable movement of said member so as to selectively control the actuation of said circuit and correspondingly variably control the magnitude of electrical energy to said circuit load, and cam means on said support adapted for engaging at least one of said electrical contacts, effective to move said one electrical contact out of engagement with the associated circuit to effectively disconnect it from a source of power.

## 3,896,411
## REVERBERATION CONDITION ADAPTIVE SONAR RECEIVING SYSTEM AND METHOD

**Larry C. Mackey, Greensburg, Pa., and Dennis C. Kozlowski, Lutherville, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Feb. 19, 1974, Ser. No. 443,874**
**Int. Cl. G01s** *9/66, 7/66*
**U.S. Cl. 340—3 R** **11 Claims**



1. Apparatus for controlling the gain of a sonar receiving circuit during ping periods between transmitted pulses of acoustic energy to minimize the effects of changing reverberation conditions comprising:

means for detecting the envelope of return acoustic energy during each ping period;

means for storing a first signal representative of the amplitude of the detected envelope at a first predetermined time during a first ping period and for storing a second signal representative of the amplitude of the detected envelope at a second predetermined time during the first ping period subsequent to the first time, the first and second stored signals representing an expected reverberation condition for ping periods subsequent to the first ping period; and,

means for controlling the gain of the sonar receiving circuit during a second ping period subsequent to the first ping period in response both to the amplitude of the detected envelope in the second ping period and to the first and second stored signals.

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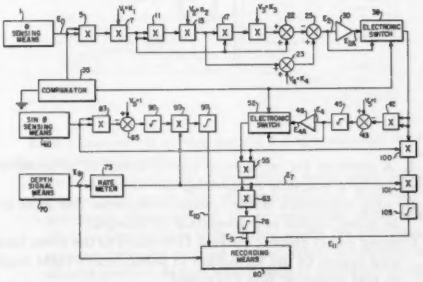
## 3,896,412
## METHOD AND APPARATUS FOR LOGGING THE COURSE OF A BOREHOLE

**Ulrich Rohr, Hamburg, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany**

**Filed Nov. 19, 1973, Ser. No. 417,445**
**Int. Cl. G01v** *1/40;* **G01C** *9/14*
**U.S. Cl. 340—15.5 BA** **5 Claims**



1. A system for logging the course of a borehole comprising a logging tool including means for providing a $\theta$ signal corre-

sponding to an azimuth angle $\theta$, and means for providing a $\phi$ signal corresponding to an angle $\phi$ of inclination; conduction means connected to all the signal means in the logging tool for conducting the signals to the surface, and surface electronics including means for providing a $dl/dt$ signal corresponding to the rate of travel of the logging tool through the borehole; means connected to the conducting means and to the $dl/dt$ signal means for providing a $T_r$ signal in accordance with the $\phi$ signal and the $dl/dt$ signal, said $T_r$ signal corresponds to a distance along an axis $T_r$ of a cartesian coordinate system having its reference point at the mouth of the borehole, the axis $T_r$ extends in a vertical direction; means connected to the conducting means and to the $dl/dt$ signal means for providing an $A_N$ signal in accordance with the $\phi$, $\theta$ and $dl/dt$ signals, said $A_N$ signal corresponds to a distance along an axis $A_N$ in the coordinate system which extends in a northern direction from the reference point, means connected to the conducting means and to the $dl/dt$ signal means for providing an $A_o$ signal in accordance with the $\phi$, $\theta$ and $dl/dt$ signals, said $A_o$ signal corresponds to a distance along an axis $A_o$ in the coordinate system which extends in a direction perpendicular to the directions of the $T_r$ and $A_N$ axes.

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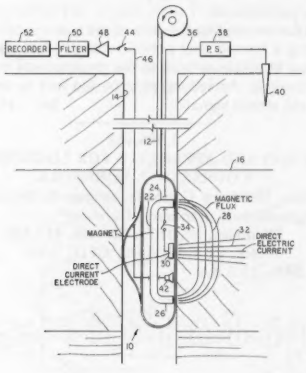
**3,896,413**

## PERMEABILITY LOGGING METHOD USING APPARATUS COMPRISING CURRENT ELECTRODES BETWEEN ELECTROMAGNETS, CURRENT ELECTRODE ON THE SURFACE AND ACOUSTIC LISTENING DEVICES TO DETECT PRESSURE RELATED NOISE

**Donald J. Dowling, and John F. Boyd, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.**

**Filed Jan. 28, 1974, Ser. No. 437,089**
**Int. Cl. G01v** *1/40, 3/08*
**U.S. Cl. 340—15.5 BH** **14 Claims**




1. A method for measuring permeability of a formation adjacent to a borehole comprising the steps of:

forming essentially stable constant magnetic flux lines in a localized region in a formation of interest;

forming direct electric current flow paths in the same localized region of the formation at substantially right angles to said magnetic flux lines; and

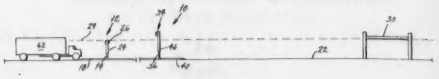
listening to the noise of fluid movement in the formation to obtain an indication of formation permeability.

**3,896,414**

## ROADWAY DETOUR SYSTEM FOR VEHICLES

**Charles J. Rulo, 2113 Stansbury, St. Louis, Mo. 63118**

**Filed July 11, 1973, Ser. No. 378,254**
**Int. Cl. G08g** *1/04*
**U.S. Cl. 340—31 R** **9 Claims**



1. A roadway detour system for vehicles comprising means for sensing the height of vehicles in combination with means for providing a detour signal, said height sensing means including means for transmitting a light beam at a predetermined height across said roadway, and light sensing means for receiving the beam of light crossing said roadway, said light sensing means including a collimating member for collimating said light beam, said detour signal means being connected to and operable by said height sensing means and comprising a signal device located between said height sensing means and a roadway exit, and normally inactivated when said light beam is received by said light sensing means, said roadway detour system further including means for activating said signal device to produce said detour signal when reception of said light beam by said light sensing means is interrupted by a vehicle having a height in excess of said predetermined height.

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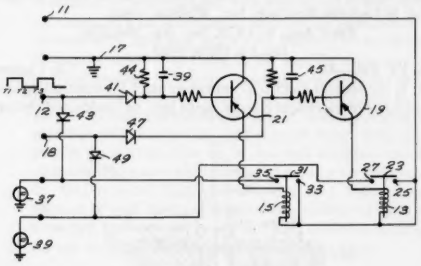
**3,896,415**

## SIGNAL LIGHT CIRCUIT INTEGRATOR

**Adolphus J. Carter, III, 205 E. 57th St., Savannah, Ga. 31405**

**Filed July 6, 1973, Ser. No. 377,014**
**Int. Cl. B60q** *1/38*
**U.S. Cl. 340—67** **5 Claims**



5. A signal light integrator circuit which integrates separate turn signal light and brake light signals generated by a turn signal and brake light system in a vehicle for energizing single filament lamps in a trailer connected to said vehicle wherein said integrator circuit is coupled to said vehicle turn signal and brake light system without modifying said vehicle system and wherein the power for operating said integrator circuit is derived from said vehicle system, the combination comprising, a first switch means for conducting a brake light signal from said vehicle to a first single filament indicator light positioned in said trailer, said first switching means being normally open, second switching means for conducting said brake light signal from said vehicle to a second single filament indicator light positioned in said trailer, said second switching means being normally open, each of said switching means being closed upon the application of a brake light signal from said vehicle thereto,

means for energizing said first single filament indicator lamp with a first turn signal coupled from said vehicle to said trailer,

means for energizing said second single filament indicator lamp with a second turn signal coupled from said vehicle to said trailer,

means for opening said first switching means when a first turn signal and a brake light are simultaneously coupled to said circuit,

means for opening said second switching means when said second turn signal and said brake light are simultaneously coupled to said circuit, wherein said means for opening said first and second switching means comprises a pair of semiconductor switching devices each connected to respective ones of said switching means and each having its control terminal connected to a turn signal light circuit of said vehicle, and

means for storing a turn signal light voltage at said control terminal to thereby maintain said semiconductor switching device in a cut-off state when the turn signal light circuit of said vehicle is energized.

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**3,896,416**

## DIGITAL TELECOMMUNICATIONS APPARATUS HAVING ERROR-CORRECTING FACILITIES

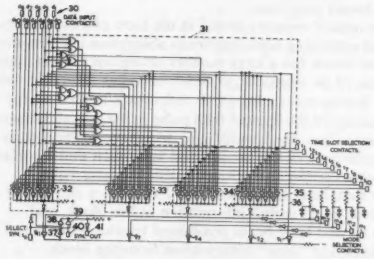
**Robert Barrett, Welwyn, and John Ashley Gordon, Hatfield, both of England, assignors to British Secretary of State for Defence, London, England**

**Filed May 11, 1973, Ser. No. 359,375**

**Claims priority, application United Kingdom, May 15, 1972, 22705/72**

**Int. Cl. G06f** *11/12*

**U.S. Cl. 340—146.1 AL** **20 Claims**



1. Multiplexing and encoding apparatus which comprises:

input connection means comprising $n$ separate input lines for accepting information bit-signals in parallel from $n$ distinct channels;

first encoder means connected to a subset of $k_1$ of the said $n$ input lines, for deriving $(n-k_1)$ check-bit signals from any set of $k_1$ information-bit signals occurring one on each of the lines of the said subset, according to a first predetermined systematic block code;

second encoder means connected to a subset of $k_2$ of the said $n$ input lines, for deriving $(n-k_2)$ check-bit signals from any set of $k_2$ information-bit signals occurring one on each of the lines of the said subset, according to a second predetermined systematic block code;

and output means for applying the information-bit signals and check-bit signals from any selected encoder means to an output channel;

wherein $n>k_1>k_2>0$, and the said predetermined block codes have a common block length $n$.

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**3,896,417**

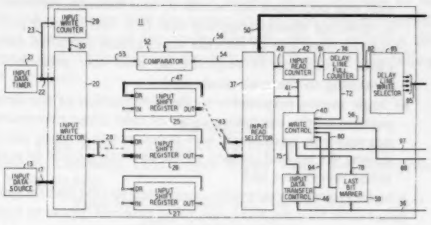
## BUFFER STORE USING SHIFT REGISTERS AND ULTRASONIC DELAY LINES

**David Beecham, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Nov. 30, 1973, Ser. No. 420,374**

**Int. Cl.[2] G11C** *7/00, 9/00, 21/00, 11/23*

**U.S. Cl. 340—172.5** **8 Claims**



1. A buffer store comprising

a plurality of synchronous memory modules,

means including a set of three input shift registers for selectively receiving an asynchronous stream of data signals and time buffering the stream of data signals,

means for synchronously transferring the buffered stream of data signals from the input shift registers into storage in the memory modules on an interleaved time compression basis,

means including a set of three output shift registers for selectively retrieving the stored stream of data signals in sequential order from the memory modules, and

means responsive to asynchronous demand signals for time buffering the retrieved stream of data signals from the output shift registers and forwarding the retrieved stream of data.

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**3,896,418**

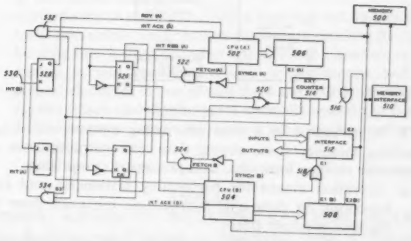
## SYNCHRONOUS MULTI-PROCESSOR SYSTEM UTILIZING A SINGLE EXTERNAL MEMORY UNIT

**Max W. Brown, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 176,666, Aug. 31, 1971, abandoned. This application Sept. 25, 1973, Ser. No. 400,577**

**Int. Cl. G06f** *5/16*

**U.S. Cl. 340—172.5** **7 Claims**



1. In a computing system having a single external memory, the combination comprising:

a. first and second central processing units, each processor formed on a single chip of semiconductor material, each processor characterized by an operating cycle that includes a first portion only during which the processor can access a selected portion of said external memory and a second portion during which data is operated on by the CPU, each CPU having an accumulator register for storing the result of data operation;

b. means operably connected to said first and second processing units for synchronizing operation thereof such that said first portion of said first processor operating cycle occurs only simultaneously with said second portion of said second processor operating cycle; said means for synchronizing including

i. switching means for setting one processor to a wait condition is response to a first input signal selecting said one processor for access to said external memory,

ii. detector means coupling said first and second processors operable to provide an enabling signal to said other processor in response to said one processor switching to the wait mode and

iii. logic means responsive to the termination of the first portion of the operating cycle of said other processor operative to enable said one processor to a ready state during the second portion of the operating cycle of said other processor; and

c. interface circuitry operably connected to first and second processors for selectively coupling external inputs to said processors and for providing system outputs.

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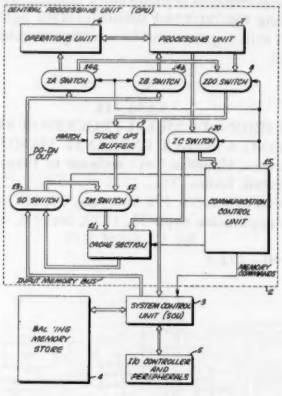
## 3,896,419
## CACHE MEMORY STORE IN A PROCESSOR OF A DATA PROCESSING SYSTEM

**Ronald E. Lange; Matthew A. Diethelm, both of Phoenix, and Phillip C. Ishmael, Tempe, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Jan. 17, 1974, Ser. No. 434,178**
**Int. Cl.[2] G06F** *13/06*
**U.S. Cl. 340—172.5** **7 Claims**




1. A processor in a data processing system including a backing memory store storing data and instructions in addressable storage locations, said processor comprising:

a. operation means for performing arithmetic and logic functions on data and instructions retrieved from the backing memory store;

b. processing means for processing data and instructions according to signals generated by said operation means and the data processing system;

c. a communication control unit for controlling interface functions between the units of the processor and between the processor and the backing memory store in accordance with instructions processed by said processing means;

d. a buffer register;

e. a cache section including a cache store and means for storing data and instructions into addressable locations in said cache store;

f. first switch means controlled by said communication control unit for controlling transfer of data information from said processing means to said buffer register and to said backing memory store;

g. second switch means controlled by said communication control unit for selectively controlling transfer of data information from said backing memory store or said cache section to a third switch means and to said operations unit and said processing unit; and

h. said third switch means controlled by said communication control unit for selectively controlling transfer of data information from said second switch means or said buffer register for storage in said cache store of said cache section; said third switch means operable in a store aside configuration to transfer the data information stored in said buffer register into said cache store if the address of the data information is in said cache section.

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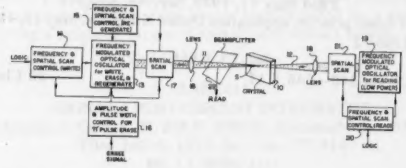
## 3,896,420
## FREQUENCY SELECTIVE OPTICAL MEMORY

**Alexander Szabo, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada**

**Filed Jan. 14, 1972, Ser. No. 217,893**
**Int. Cl.[2] G11C** *13/04*
**U.S. Cl. 340—173 CC** **3 Claims**




1. A data storage system comprising:

a. a broad band laser,

b. an optical memory device in the form of a block of material exhibiting inhomogeneous absorption line broadening and which has a large number of regions that on application of an intense light beam becomes saturated only at a homogeneous linewidth frequency related to the frequency of the applied light pulse in the overall inhomogeneous line band-width and which is positioned in the beam path of the broad-band laser such that a surface is being continuously flooded with the laser light,

c. a first laser beam positioned to scan a surface of said block and "write" information in the block, and

d. a second laser beam positioned to scan a surface of said block and "read" information from the block.

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## 3,896,421
## BI-DIRECTIONAL MAGNETIC DOMAIN TRANSFER CIRCUIT

**William E. Flannery, Norristown, Pa., assignor to Sperry Rand Corporation, Blue Bell, Pa.**

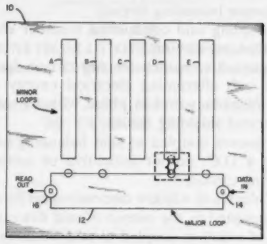
**Filed Nov. 9, 1973, Ser. No. 407,675**
**Int. Cl. G11c** *11/14, 19/00*
**U.S. Cl. 340—174 TF** **6 Claims**

1. In a magnetic arrangement for transferring a single-wall domain in a layer of magnetic material from a first closed-loop to a second closed-loop both defined by magnetically soft elements and utilizing an in-plane rotating magnetic field, the improvement comprising:

a. first and second identical, separate linking means arranged between said first and second closed loops and in a directly facing relationship,

b. a single conductor means positioned directly upon and for forming a magnetic gradient along said linking means, said single conductor being oriented upward and downward repetitively between said first and second closed loops, said conductor being in contact with the elements

of said first and second loops and said first linking means when oriented in an upward direction, said conductor being in contact with the elements of said first and second loops and said second linking means when oriented in a downward direction,




said first linking means providing means for transferring a wall domain from said first closed-loop to said second closed-loop, and said second linking means providing means for transferring said wall domain from said second closed-loop to said first closed-loop by rotating said in-plane field in conjunction with a timed current signal applied to said conductor.

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**3,896,422**

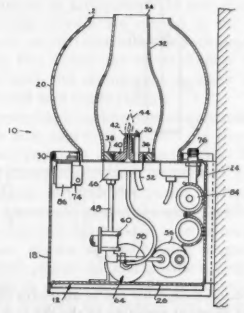
## ALARM SYSTEM OPERATED BY AMBIENT CONDITIONS

**Stanley J. Kowalsky, 4 Stan St., Latrobe, Pa. 15650**

**Continuation-in-part of Ser. No. 848,492, Aug. 8, 1969, abandoned. This application Nov. 5, 1971, Ser. No. 196,035**

**Int. Cl. G08b** *17/06*

**U.S. Cl. 340—227 R** **7 Claims**




1. A warning device responsive to abnormal ambient atmospheric conditions, especially in a room of a building and comprising: a pilot burner device having an imperforate base member, vertically elongated tubular chimney means open only at the top and at the bottom, said chimney means being sealed at the bottom to said base member of said burner device and protectively enclosing the burner device for limited exposure to ambient atmospheric conditions, regulated means connected to the burner device through said base member and supplying fuel thereto at a controlled rate for maintaining a continuous flame within the chimney means near the lower end thereof under normal ambient atmospheric conditions during which oxygen is supplied to said burner device solely by air which flows downwardly in said chimney means via the open upper end of said chimney means, said chimney means permitting only sufficient air to pass from the upper end of the chimney means downwardly therein in counterflow to the gases rising from said burner device to maintain said flame under normal ambient atmospheric conditions whereby an abnormal ambient atmospheric condition creating an oxygen deficiency will cause said flame to be extinguished, flame detecting means operatively associated with the burner device and operable for sensing extinction of the flame, and normally inactive alarm means operatively connected to said flame detecting means and operable for producing an alerting signal in response to sensing by said flame detecting means of extinction of said flame, said device being adapted to be placed in a room with the upper end of said chimney means near the ceiling of the room whereby the air entering the upper end of the chimney means is taken from near the ceiling of the room.

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**3,896,423**

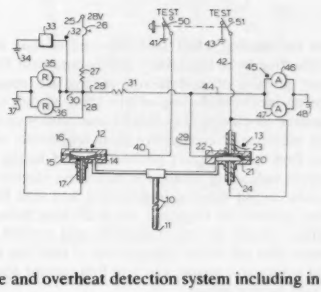
## FIRE AND OVERHEAT DETECTION SYSTEM

**John E. Lindberg, 1211 Upper Happy Valley Rd., Lafayette, Calif. 94549**

**Filed Sept. 14, 1973, Ser. No. 397,441**

**Int. Cl. H01h** *37/40*

**U.S. Cl. 340—229** **8 Claims**




1. A fire and overheat detection system including in combination:

tubular sensor means having one end closed and one end open,

a primary responder having a housing and an electrically conductive primary diaphragm dividing said housing into (1) a first chamber connected to an open end of said sensor means, and (2) a closed and sealed second chamber, said first chamber being provided with a first electrode, said primary diaphragm normally being in contact with the electrode, and actuated to move away from it at a pressure which is different from the pressure normally in said sensor means, and

a confirmation responder having a housing and an electrically conductive confirmation diaphragm dividing its said housing into a third chamber and a fourth chamber connected to said open end of said sensor means, and a second electrode in one of said third and fourth chambers against which said diaphragm is normally seated and from which it moves away when said sensor reaches ambient pressure.

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**3,896,424**

## SENSING APPARATUS INCLUDING LATCHING MEANS

**John R. Peltz, and Nikolaus A. Szeverenyi, both of Warren, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.**

**Continuation-in-part of Ser. No. 236,149, March 20, 1972. This application Jan. 4, 1974, Ser. No. 430,700**

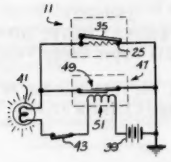
**Int. Cl. G08b** *21/00*

**U.S. Cl. 340—244 R** **8 Claims**

1. A sensing apparatus comprising:

a sensor device including a housing member defining a chamber, an electrically conductive tip member adapted for being exposed to a fluid, said tip member secured to said housing and forming a closure for said chamber to

prevent fluid entrance into said chamber, an electrically resistive heater means within said chamber having first and second spaced apart electrically conductive portions, said second electrically conductive portion in heat conductive relationship to said electrically conductive tip member, and an electrically conductive heat responsive means secured at one end to said second spaced apart portion of said heater means and having a free end adapted for engaging said first spaced apart portion of said heater means only when the temperature surrounding said electrically conductive heat responsive means exceeds a predetermined level; and




means for sensing when said free end of said electrically conductive heat responsive means and said first spaced apart portion of said heater means are engaged, said sensing means including an electrical circuit comprising a source of electrical potential operatively connected to said electrically conductive heat responsive means and said first spaced apart portion of said heater means, a current indicating means for indicating electrical current in said circuit when said free end and said first spaced apart portion are engaged, and a latching means for providing a steady electrical signal to said current indicating means after the initial engagement of said free end of said heat responsive means and said first spaced apart portion of said heater means.

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**3,896,425**

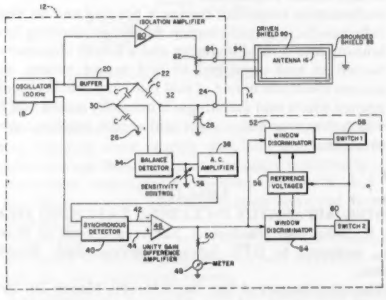
## PROXIMITY DETECTOR

**Herman W. Erichsen, Medfield, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.**

**Filed Oct. 16, 1973, Ser. No. 406,866**

**Int. Cl. G08b** *13/24*

**U.S. Cl. 340—258 B** **9 Claims**




9. A protective device comprising:

a conductive member located adjacent an area to be protected;

first shielding means for confining the electric field provided by said conductive member to the area to be protected;

second shielding means for changing the capacitance between said conductive member and said first shield means;

means coupling said second shielding means for exciting said shielding means with alternating electrical energy at a preselected frequency;

a capacitance balancing circuit;

means coupling said conductive member electrically into said balancing circuit;

means coupled to said balancing circuit for exciting said circuit with alternating electrical energy at said preselected frequency and in phase with the energy exciting said second shielding means;

detector means coupled to said balancing circuit for producing a D.C. output indicative of unbalance in said balancing circuit;

a pair of electrical window discriminators having maximum limits coupled to the output of said detector means; and a pair of switches coupled to said windows for actuation when the maximum or minimum limit of either window discriminators is exceeded by the output of said detector means.

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**3,896,426**

## THEFT ALARM EMPLOYING SELF-ADJUSTING DISTURBANCE SWITCH

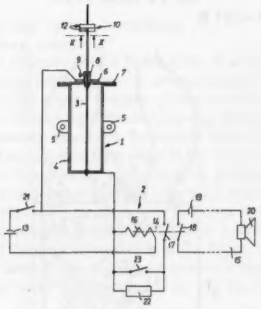
**Philippe Laurent, Eaubonne, France, assignor to Klaxon, Neuilly-sur-Seine, France**

**Filed Jan. 9, 1973, Ser. No. 322,151**

**Claims priority, application France, Jan. 11, 1972, 72.00714**

**Int. Cl. G08b** *13/02*

**U.S. Cl. 340—261** **11 Claims**




1. A disturbance switch for use in an alarm device comprising at least one element sensitive to shocks and vibration, and electric means, said sensitive element comprising at least one rod having a circular cross-sectional contour and one end fitted in a frame structure to assume a generally upright position, said rod having flexibility characteristics at least in the vicinity of its fitted end, and an abutment member disposed on said frame structure for limiting the beat of said rod in at least one direction, said abutment member being remote from the fitted end of said rod, at least one portion of said abutment member and at least one portion of said rod which is adapted to contact said abutment member consisting of electrical conducting material, and electric means comprising said portions of said abutment member and rod consisting of electrical conducting material, a source of current and a relay controlling the release of an alarm circuit, said relay being so connected to said current source that said relay is closed when a contact takes place between said portions of said abutment member and rod, and remains closed even after said contact is discontinued, the improvement in the disturbance switch comprising said abutment member consisting of an annular

member surrounding said rod with a certain clearance and said annular member being adapted to move freely radially with respect to said rod whereupon vibration of said flexible rod self-centers the freely radially moveable annular member about said flexible rod.

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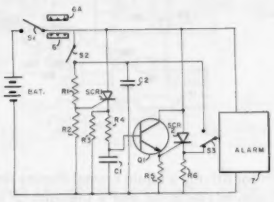
**3,896,427**

## MAGNETICALLY OPERATED ALARM

**James P. Campman, 12900 Broadmoor Rd., Silver Spring, Md. 20904**

**Filed June 27, 1974, Ser. No. 483,827**
**Int. Cl.[2] G08B** *13/08*
**U.S. Cl. 340—274 R** **2 Claims**




1. An alarm apparatus responsive to the relative motion between two objects in one of two substantially parallel directions comprising:

an actuating magnet mounted on one of said objects;

a pair of magnetically actuated reed switches mounted on the other of said objects, arranged in parallel to each other and spaced from each other in the direction of motion whereby said reed switches sequentially move into juxtaposition with said actuating magnet and are actuated thereby to their closed positions;

a biasing magnet associated with the reed switch which secondly arrives in juxtaposition to said actuating magnet when the said objects are moved in the other of two substantially parallel directions and arranged to produce a magnetic flux across the reeds thereof insufficient to close said reeds but strong enough when said reeds are closed to hold said reeds closed;

electrically operable switching means actuated into its "on" state when both said reed switches are simultaneously in their closed positions and actuated into its "off" state when said biased reed switch is opened;

means energized by said electrically operable switching means to continually sound the alarm while said electrically operable switching means is in its on state; and

a key magnet, similar to the biasing magnet in polarity which, when placed in juxtaposition with said biasing magnet with its magnetic flux in opposition to the flux of said biasing magnet, for opening said biased reed switch to silence said alarm and to condition said apparatus to again be armed when the objects are moved in the opposite direction relative to each other.

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**3,896,428**

## DISPLAY APPARATUS WITH SELECTIVE CHARACTER WIDTH MULTIPLICATION

**Robert C. Williams, Churchville, Pa., assignor to GTE Information Systems Incorporated, Stamford, Conn.**

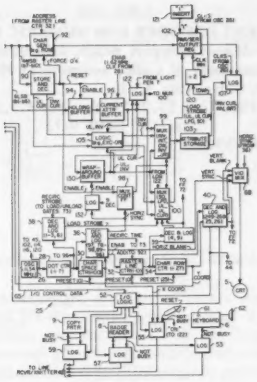
**Filed Sept. 3, 1974, Ser. No. 502,889**
**Int. Cl.[2] G06F** *3/14*
**U.S. Cl. 340—324 AD** **7 Claims**

1. Display apparatus for displaying images of data characters having first and second widths, comprising:

display means for displaying images of data characters;

data source means for producing a set of data including a plurality of characters for a predetermined number of times, said characters including data characters the images of which are to be displayed by the display means and attribute characters interspersed with the data characters, each of said attribute characters including width data specifying that the images of data characters following the attribute character are to be displayed with a first width or a second, greater width, each of the data characters specified by the width data of an attribute character to have a display image of the second width being followed in the set of data by $n$ additional, successive data characters, where $n$ is an integer;

display signal generator means having an input for receiving each data character in the set of data for the predetermined number of times, said display signal generator means being operative in response to receiving each data character at its input for the predetermined number of times to produce a set of display data signals corresponding to the data character, each display data signal comprising a series of bits;



first circuit means for receiving and storing therein display data signals of sets of display data signals produced by the display signal generator means and corresponding to data characters;

second circuit means coupled to the first circuit means and operative to produce clock signals for clocking the bits of display data signals stored in the first circuit means out of the first circuit means at a predetermined first rate;

third circuit means coupled to the data source means and operative to receive and store therein for the predetermined number of times the width data of each attribute character produced by the data source means;

fourth circuit means coupled to the third circuit means and to the first circuit means, said fourth circuit means being operative when the width data of an attribute character stored in the third circuit means for the predetermined number of times specifies that the images of data characters following the attribute character are to be displayed with the first width to enable the first circuit means to be clocked at the predetermined first rate whereby the bits of the sets of display data signals corresponding to these data characters are clocked out of the first circuit means at the predetermind first rate, and said fourth circuit means being operative when the width data of an attribute character stored in the third circuit means for the predetermined number of times specifies that the images of data characters following the attribute character are to be displayed with the second width to cause the first circuit means to be clocked at a second rate of $1/(n+1)$ times the predetermined first rate, whereby the bits of the sets of display data signals corresponding to the first, $[(n+1)+1]$th, $[2(n+1)+1]$th, $[3(n+1)+1]$th, etc., data characters following the attribute character are clocked out of the first circuit means at the second rate and the bits of the sets of display data signals corresponding to the

intervening *n* data characters are prevented from being entered into and clocked out of the first circuit means;

said display means being coupled to the first circuit means and operative to receive the bits of the sets of display data signals clocked out of the first circuit means at the first rate or second rate, said display means being operative in response to receiving the bits of each set of display data signals clocked out of the first circuit means at the first rate to provide an image, having a first width, of the corresponding data character, and operative in response to receiving the bits of each set of display data signals clocked out of the first circuit means at the second rate to provide an image, having a second width, of the corresponding data character.

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**3,896,429**

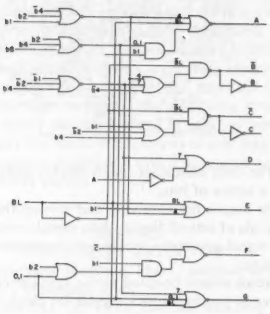
## SEGMENT DECODER FOR NUMERIC DISPLAY

**Norman E. Moyer, Newport Beach, and Dennis E. Walker, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed June 25, 1973, Ser. No. 373,569**

**Int. Cl.[2] G09F** *9/32*

**U.S. Cl. 340—336** **10 Claims**



**1.** A character segment decoder comprising:

an intermediate decoding stage;

a final decoding stage of logical gates having inputs for coded character signals for characters of a group of characters and decoded output signals of the intermediate stage, said gates of the final stage having individual outputs corresponding to segments of a display indicator for visual display of the characters;

said intermediate stage including a plurality of logical gates having inputs for applying coded character signals representing predetermined characters of the group, each of said intermediate gates sensing a particular subcombination included in said character signals to produce intermediate logical output signals also coupled to respective logical gates of said final stage, said logical gates of the final stage being responsive to logical signals at its inputs to produce said individual outputs corresponding to segments of the display indicator for representing predetermined characters of the group of characters; and

said intermediate and final stages including interconnections providing for feedback combining logical signals in final and intermediate stages for producing output signals for segments of character to display a character according to selected subcombinations of coded character signals applied to the character display indicator.

**3,896,430**

## DRIVING SYSTEM OR LIQUID CRYSTAL DISPLAY DEVICE

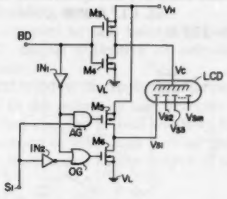
**Yoshikazu Hatsukano, Kodaira, Japan, assignor to Hitachi, Ltd., Japan**

**Filed Nov. 27, 1973, Ser. No. 419,442**

**Claims priority, application Japan, Nov. 27, 1972, 47-118074**

**Int. Cl.[2] G08B** *5/36*

**U.S. Cl. 340—336** **6 Claims**



**1.** A system for driving a liquid crystal display device including a first common electrode and a plurality of second electrodes, each of said second electrodes being spaced apart from said first common electrode through said liquid crystal therebetween, said system comprising:

first means, coupled to said first electrode, for supplying a first drive signal thereto; and

second means, coupled to said second electrodes, for selectively applying each of a plurality of different voltage levels including at least three voltage levels to each of said second electrodes, as a second drive signal, so as to drive said display device together with said first means.

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**3,896,431**

## ANALOGUE-TO-DIGITAL CONVERTERS

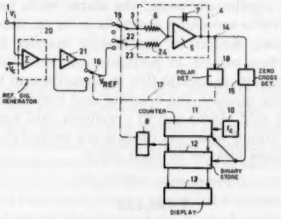
**Brian Arthur Leonard Dickinson, Cambridge, England, assignor to Pye Limited, Cambridge, England**

**Filed Nov. 15, 1973, Ser. No. 416,038**

**Claims priority, application United Kingdom, Nov. 29, 1972, 55139/72**

**Int. Cl. H03k** *13/20*

**U.S. Cl. 340—347 NT** **5 Claims**



**1.** In an analogue-to-digital converter of the dual slope integration type having an integrator portion, an analog input signal of one polarity, a reference signal of opposite polarity being supplied thereto and including means for alternately connecting said input signal and reference signal to said integrator portion, said improvement comprising:

means for generating a variable reference signal, the magnitude of said variable reference signal being varied in dependence on the magnitude of the analogue input signal, for producing a predetermined non-linear relationship between the analogue and the digital output of the converter.

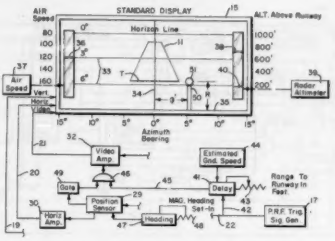
## 3,896,432
## PERSPECTIVE RADAR AIRPORT RECOGNITION AND LANDING GUIDANCE SYSTEM

David W. Young, 627 N. Beachwood Ave., North Hollywood, Calif. 91506

Continuation-in-part of Ser. No. 847,121, Aug. 4, 1969, Pat. No. 3,778,821. This application Aug. 3, 1973, Ser. No. 385,534

Int. Cl.[2] G01S 7/20, 7/22

U.S. Cl. 343—5 LS 10 Claims




1. An airport recognition and landing guidance system for use in an aircraft as a completely self-contained system within the aircraft operative independently of any landing signals emanating from the airport or other ground areas after a standard FAA Air Traffic Control final fix is established, comprising, in combination:

a. a radar system including a PRF synchronizing trigger signal generator and antenna means, said radar system generating vertical, horizontal, and video radar signals for providing a basic perspective display of actual, not stylized terrain in front of the aircraft when viewed on a display screen; and

b. guidance control means incorporating known information relative to an airport complex for comparison with the perspective radar information in said radar signals of actual terrain.

## 3,896,433
## PROCESSING DEVICE

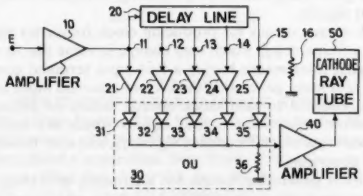
Roland Carrè, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 15, 1974, Ser. No. 433,455

Claims priority, application France, Jan. 18, 1973, 73.01748

Int. Cl. G01s 9/00; H03k 5/04

U.S. Cl. 343—5 R 3 Claims




1. A processing device for processing video signals in a pulse radar system, between an output of the radar's receiver which has a determined pass-band width (B) and an input of exploiting means having a narrower bandwidth (*b*), said device comprising:

delay means having an input connected to the output of said receiver and a number of outputs for delivering a plurality of output signals, the number of outputs being equal to the whole number closest to the ratio of the pass band, B/*b*, and

non linear circuit means connected between the outputs of said delay means and said exploiting means, for transmitting, amongst the output signals from said number of outputs, the signal having the greatest amplitude and blocking the other signals.

## 3,896,434
## PULSE TYPE RADAR SYSTEM

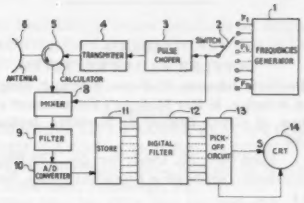
Jacques Sirven, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 4, 1974, Ser. No. 448,011

Claims priority, application France, Mar. 6, 1973, 73.07933

Int. Cl. G01s 9/02

U.S. Cl. 343—5 SA 8 Claims




1. A radar system having a high range resolution comprising:

means for transmitting a series of pulses whose carrier frequencies are distributed within a band B and whose time positions are associated with the frequencies in accordance with a linear relationship, said series of pulses being repeated with a given recurrence periodicity,

means for receiving the echo signals from objects in space and for effecting demodulation using the corresponding waves which gave rise to them,

filtering means having a band width substantially equal to the spectral width of the pulses, and

a plurality of filters coupled to said filtering means for producing at different outputs different signals which correspond to separate objects in space.

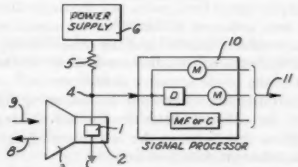
## 3,896,435
## SIMPLE RADAR FOR DETECTING THE PRESENCE, RANGE AND SPEED OF TARGETS

James Nickolas Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 235,084, March 3, 1972, abandoned. This application June 21, 1973, Ser. No. 372,397

Int. Cl. G01s 9/44

U.S. Cl. 343—9 27 Claims




1. A radar system for determining target characteristics and comprising a transmitter, receiver, signal processor, and power supply,

said transmitter including oscillator and transmitting antenna,

with said oscillator providing the carrier frequency for the transmission of energy,
with said transmitting antenna for launching said carrier frequency to the vicinity of a target,
said receiver including receiving antenna and mixer,
with said mixer for mixing said received signals with a portion of said carrier frequency
and providing a mixer output having a doppler component and a bias component,
said signal processor having the mixer output as its input and providing a first output varying as a function of the bias component of the mixer output, which first output is used to determine target characteristics and
said power supply providing the system power.

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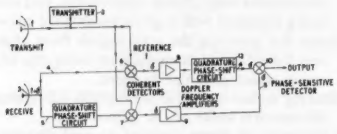
## 3,896,436
## DOPPLER RADAR RECEIVER

**Gerald Frederic Johnson, Malvern, England, assignor to Minister of Aviation, in Her Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England**

**Filed Nov. 20, 1962, Ser. No. 239,095**
**Claims priority, application United Kingdom, Nov. 27, 1961, 42401/61**
**Int. Cl. G01s 9/44, 9/22**
**U.S. Cl. 343—16 M** **15 Claims**

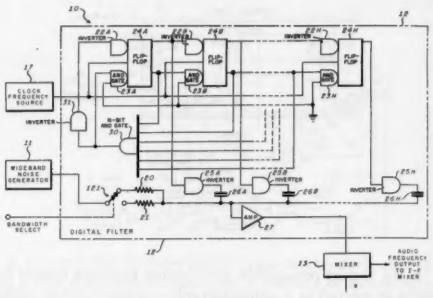


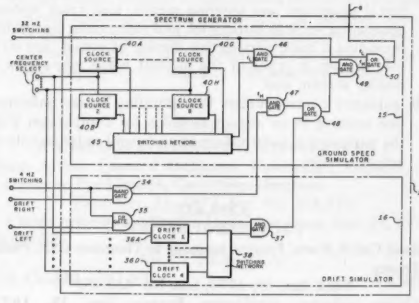

1. A Doppler radar system, wherein a phase-sensitive detector demodulates a Doppler signal derived from an incoming signal from a moving target, the detector using a reference signal of the same frequency as the Doppler signal, comprising a transmitter,
a phase sensitive detector for demodulating a Doppler signal,
two coherent incoming signal detectors each fed with reference signal from the transmitter and via divided paths with the same reflected incoming signals from a target,
two Doppler signal feed paths, one feeding a Doppler signal from one coherent detector to the signal input of the phase sensitive detector and the other feeding a Doppler signal from the other coherent detector to the reference input of the phase sensitive detector,
phase shift means connected in the incoming signal path to one of the coherent detectors for introducing a quadrature phase shift between the two incoming signals applied to the coherent detectors and,
further phase shift means connected in one of the feedpaths to the phase sensitive detector for introducing a further quadrature phase shift between the Doppler signals fed to the phase sensitive detector, whereby
unwanted Doppler frequency double sideband signals in the outputs of the coherent detectors due to noise modulated transmitter signals mixed with the incoming signals result in opposing signals in the output of the phase sensitive detector.

## 3,896,437
## APPARATUS FOR GENERATING PRECISE CROSSOVER FREQUENCY OF TWO INDEPENDENT EQUAL BANDWIDTH SPECTRA

**Richard H. Morris, Tampa, Fla., assignor to Sperry Rand Corporation, New York, N.Y.**

**Filed Oct. 11, 1973, Ser. No. 405,344**
**Int. Cl.[2] G01S 7/40**
**U.S. Cl. 343—17.7** **7 Claims**



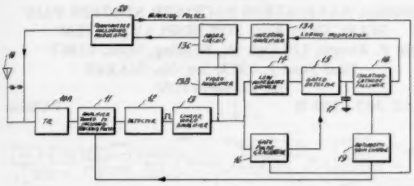




1. A simulated doppler generator comprising
noise generating means for producing wideband noise output signals,
clock source means for producing clock frequency signals at a frequency $f_n$ which may change in value due to drift,
digital filter means having a first input terminal coupled to said noise generating means and a second input terminal coupled to said clock source means or producing narrow band noise output signals which are centered about said clock frequency signal, $f_n$, and may be subject to distortion,
spectrum generating means for alternately providing first frequency signals at a first frequency, $f_H$, which are higher than said clock frequency signals, $f_n$, and second frequency signals at a second frequency, $f_L$, which are lower than said clock frequency signals, $f_n$, and
mixer means having a first input terminal coupled to said digital filter means and a second input terminal coupled to said spectrum generating means for providing two spectra at the difference output terminals thereof having a crossover frequency of said spectras which remains precisely constant even in the presence of drift in said clock frequency signals, $f_n$, and distortion in said narrow band noise output signals.

## 3,896,438
## TRACKING RADAR COUNTERMEASURE

Leo W. Schrader, Jr., East Williston, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 2, 1959, Ser. No. 817,680
Int. Cl.[2] G01S 7/38, 7/40
U.S. Cl. 343—18 E 7 Claims



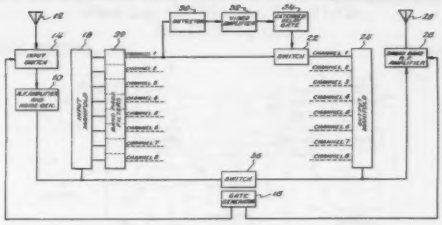
5. A device for detecting, at a target, the lobing modulation of tracking pulses arriving at said target from a conical scan radar with time lag on the order of a fraction of the width of the tracking pulses which comprises, at said target, receiving means for intercepting, amplifying and detecting said tracking pulses, a condenser, low impedance gate means connecting said receiving means and said condenser, normally operable for blocking any transfer of energy in both directions between said receiving means and said condenser but operable when opened to connect said condenser and receiving means and thereby adjust the voltage on said condenser according to the amplitude of the detected pulse arriving while the gate is opened, gate pulse generating means connected between said receiving means and said gate means, responsive to said detected pulse and causing opening of said gate means solely during a selected portion of the peak of said pulse, bias creating means having a high imput impedance and low output impedance connected to said condenser for providing a bias voltage varying according to the voltage variations on said condenser and means connecting said bias creating means and said receiving means for providing automatic gain control bias to said receiving means and cause the latter to operate continuously linearly independently of incoming pulse amplitude and preserve lobing modulation of the incoming pulses.

## 3,896,439
## MULTI-SPOT RADAR JAMMING SYSTEM

John M. Lester, Garden City; Philip W. Crist, Roslyn Heights, and Charles E. O'Toole, Whitestone, all of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 31, 1955, Ser. No. 543,647
Int. Cl.[2] H04K 3/00
U.S. Cl. 343—18 E 8 Claims

1. Apparatus comprising broad band signal receiving and noise generating means, means for channelizing the output signals of said receiving and generating means according to the frequency content thereof, said channelizing means including a plurality of band pass filters tuned respectively to different frequency channels, means for gating the output of each of said filters including a detector coupled to the output of the associated filter, a switch coupled to the output of said associated filter, and means for closing said switch for a predetermined interval of time in response to an output signal above a predetermined level from the detector, broad band transmitting means, and means for combining and coupling the output signals of said gating means to the transmitting means,

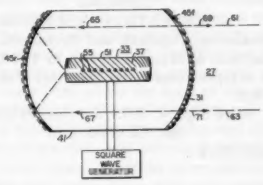


whereby the transmitting means produces an output signal having a frequency band coextensive with that of the signal passed by the gating means.

## 3,896,440
## RETRODIRECTIVE PASSIVE BEACON FOR SIMULATING A MOVING TARGET

Myron S. Wheeler, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1971, Ser. No. 202,470
Int. Cl. H04k 3/00
U.S. Cl. 343—18 D 17 Claims




1. A reflector for electromagnetic radiation including an array of conductors of said radiation spaced along a surface by a distance less than one-half wavelength of said radiation, diodes interposed in said conductors at intervals less than one-half wavelength of said radiation, means connected to said diodes for rendering said diodes alternately conducting and non-conducting, said conductors directly reflecting said radiation when said diodes are conducting and transmitting said radiation when said diodes are non-conducting, and means for reflecting the transmitted radiation, said directly reflected radiation and said reflected transmitted radiation being projected in a common beam in which said reflected transmitted radiation and said directly reflected radiation are displaced in phase with reference to each other.

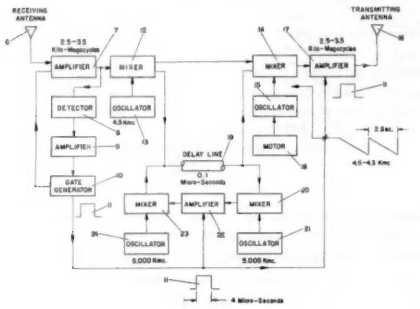
## 3,896,441
## ELECTRIC SIGNALING SYSTEM

Martin R. Richmond, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 14, 1954, Ser. No. 423,178
Int. Cl. G01s 9/56; H04k 3/00
U.S. Cl. 343—18 E 11 Claims

1. An electrical apparatus for producing a sequence of pulses of high frequency energy in response to a received pulse, wherein the frequencies of selected produced pulses are successively algebraically increased by a predetermined increment comprising in combination, means for receiving a pulse of high frequency electric energy; means for translating said pulse with a delay of a predetermined time interval; means for converting said delayed pulse into a frequency enhanced pulse having a frequency algebraically increased from that of said delayed pulse by a predetermined increment; means for feed-

ing back a pulse of a portion of the energy of said frequency enhanced pulse; means for translating said feed-back pulse with a dealy of a predetermined time interval; means for converting said delayed feed-back pulse into a further frequency enhanced pulse having a frequency algebraically increased from that of said delayed feed-back pulse by a predetermined increment; and means for translating the resultant sequence of pulses having successively algebraically increased frequencies.

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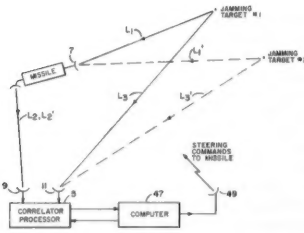
**3,896,442**

**CORRELATION PROCESSOR**

**John R. Heminway, Topsfield, and Herbert M. Sanborn, Framingham, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Sept. 4, 1973, Ser. No. 392,914**
**Int. Cl. G01s** *7/36*
**U.S. Cl. 343—18 E** **6 Claims**




**1.** Correlator system comprising at least one signal generator means; first, second, and third receiving means; said first receiving means being located spacially from said second and third receiving means; transmitting means on said first receiving means; said first receiving means receiving signals from said signal generating means and transmitting them to said second receiving means; said third receiving means receiving the signals generated by said signal generating means; a variable delay line; first mixer means having first and second inputs and an output; an output of said third receiving means connected through said variable delay line to one of the inputs of said mixer means; an output of said second receiving means being connected to the other input of said mixer means; said variable delay line having a controlled input; further comprising a range control loop connected between the output of said variable delay line and said controlled input; said range control loop comprising first and second channels; each channel having a product detector which has first and second inputs; each product detector having the signal from said second receiving means connected to the first input; a delay line connected between the output of the variable delay line and the other input of said product detector in said first channel; the other input of the product detector in said second channel being connected directly to the output of said variable delay line; a differential amplifer having first and second inputs and an output; the outputs of said product detectors being connected to different inputs of said differential amplifier; and the output of the differential amplifier being connected to the controlled input of said variable delay line.

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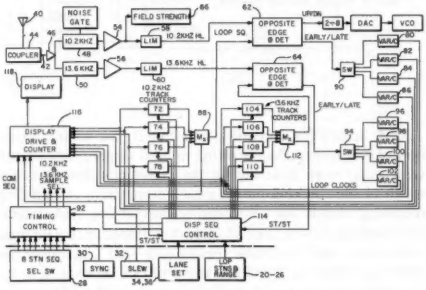
**3,896,443**

**OMEGA NAVIGATION RECEIVER STATION PAIR SELECTION AND LOP DISPLAY SYSTEM**

**Harold P. Zitzow, 129 Oak St., Reading, Mass. 01867**

**Filed June 1, 1973, Ser. No. 366,045**
**Int. Cl. G01s** *1/30*
**U.S. Cl. 343—105 R** **7 Claims**




**1.** In a navigation receiver, a system for providing tracking of a selectable plurality of Omega station broadcasts and determination of phase differences between a plurality of the selected station broadcasts comprising:

means for receiving the sequence of Omega station broadcasts on at least one frequency thereof;

means for providing operator selection of a plurality of Omega stations which is less than the total in said sequence of broadcasts, the selection being by pairs of said stations;

a plurality of tracking loops for maintaining phase synchronization with received broadcasts;

means for phase synchronizing said tracking loops to said received broadcasts;

means responsive to operator station selection for identifying a separate tracking loop for synchronization to each different, selected station;

single means for detecting the phase difference between two tracking loops; and

means responsive to each station pair selection for sequentially providing phase difference detection of each selected pair by said detecting means.

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**3,896,444**

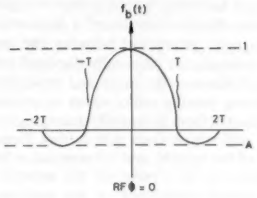
**BLENDING FUNCTION AND BLENDING FUNCTION GENERATOR**

**Paul Lin, Wollstonecraft, Australia, assignor to Amalgamated Wireless (Australasia) Limited, Australia**

**Filed Jan. 9, 1974, Ser. No. 432,029**
**Int. Cl. G01s** *1/40*
**U.S. Cl. 343—106 D** **2 Claims**

**1.** A blending function generator as defined herein comprising first means for delivering a cosine-modulated train of radio frequency energy wherein each cosine-modulated lobe has a period 2T seconds where $T = 1/mn$ where $m$ is a number and $n$ is a whole number, second means for delivering a cosine-modulated train of radio frequency energy wherein each cosine-modulated lobe has a period $T$ seconds, wherein the radio frequency energy of the second means has the same frequency as that of the first means but opposite phase and wherein zeros

in the cosine-modulated train delivered by the first means coincide with zeros in the cosine-modulated train delivered by the second means, and electronic switching means operative to select and deliver to an output terminal in contiguous successive time intervals a first cosine lobe derived from the second means, a second cosine lobe derived from the first means, and a third cosine lobe derived from the second means.

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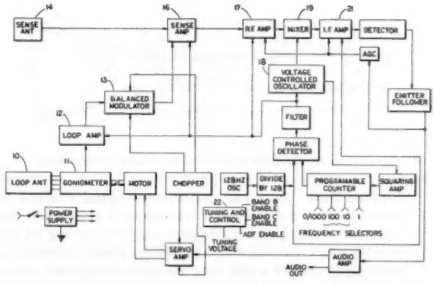
**3,896,445**

## ELECTRONIC BANDSWITCHING FOR AUTOMATIC DIRECTION FINDER

**Lowell G. Atkinson, Indianapolis, Ind., assignor to General Aviation Electronics, Inc., Indianapolis, Ind.**

**Filed Jan. 2, 1974, Ser. No. 430,241**
**Int. Cl. G01s** *5/02*
**U.S. Cl. 343—117** **5 Claims**




**1.** An ADF having a plurality of selectable frequency bands and having tuning means for selecting a desired band of the plurality of bands, the tuning means including a plurality of subcircuits connected in parallel, each subcircuit including a capacitor connected in parallel with an inductor, and transistor switching means, in series with certain inductors and capacitors in the plurality of subcircuits, for selectively coupling and decoupling said certain inductors and capacitors in the tuning means, said transistor switching means including:

a transistor switch in series with the capacitor of a first subcircuit of the plurality of subcircuits;

a transistor switch in series with the parallel combination of the capacitor and inductor of a second subcircuit of the plurality of subcircuits; and

for each additional subcircuit, a first transistor switch in series with the capacitor and a second transistor switch in series with the parallel combination of the inductor with the capacitor and first switch.

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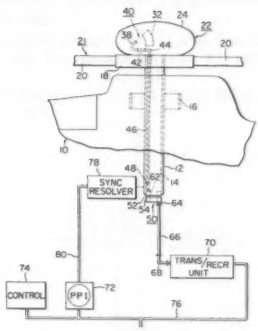
**3,896,446**

## RADAR MOUNTED ON HELICOPTER

**Teruo Kondoh, and Koki Nakatsuka, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed July 13, 1972, Ser. No. 271,526**
**Int. Cl. H01q** *1/28*
**U.S. Cl. 343—705** **6 Claims**




**1.** A radar apparatus for use with a helicopter having rotor means including a rotary shaft, a rotor head disposed upon the upper end of said rotary shaft, and a plurality of rotor blades radially extending at predetermined substantially equal angular intervals from said rotor head and defining a plane of rotation, said apparatus comprising an antenna system secured on said rotor head above the level of the rotor blades and disposed to have a direction of maximum gain between a selected pair of said adjacent rotor blades and substantially within the plane of rotation, said antenna system being rotatable with said rotor means, an oblate spheroidal radar dome, means mounting said radar dome with said antenna system disposed therein on said rotor head, a transmitter/receiver unit coupled to said antenna system to supply a transmission power to the latter and receive radar signals picked up by said antenna system, means coaxial with said rotary shaft connecting said antenna and said transmitter/receiver, and a rotary joint disposed at the rotor head to connect said antenna system to the lastmentioned means.

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**3,896,447**

## ERECTION AND RETRACTION MECHANISM FOR A FOLDABLE ANTENNA AND ITS MAST

**Charles P. Majkrzak, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.**

**Filed Apr. 22, 1974, Ser. No. 462,825**
**Int. Cl. H01q** *3/02*
**U.S. Cl. 343—709** **46 Claims**

**1.** A mechanism to erect and retract a foldable antenna and its mast with respect to a base structure comprising:

an antenna;

an antenna mast;

a U-shaped member secured to said base structure, the open end of said U-shaped member extending away from said base structure;

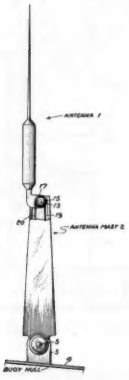
a first shaft extending through the legs of said U-shaped member and the bottom of said mast, said first shaft being connected to the bottom of said mast to prevent said first shaft from rotating relative to the bottom of said mast;

a first pair of disc-like members secured to and non-rotatable upon said first shaft, each of said first pair of disc-like members being connected to a different one of the legs of said U-shaped member;

a second shaft extending through the top of said mast and the bottom of said antenna;

a second pair of disc-like members secured to said second shaft and the bottom of said antenna said second pair of disc-like members being non-rotatable about said second shaft;

a first pair of force transmitting members interconnecting said first and second pair of disc-like members for rotation of said second pair of disc-like members in a first given direction;



a second pair of force transmitting members interconnecting said first and second pair of disc-like members for rotation of said second pair of disc-like members in a second given direction opposite to said first given direction; and

drive means connected to said first shaft to drive said shaft for control of the erection and retraction of said antenna mast and said antenna.

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**3,896,448**

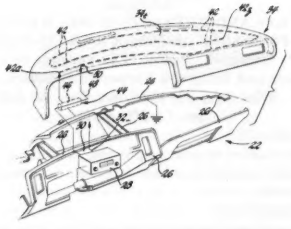
**INSTRUMENT PANEL RADIO ANTENNA**

**Charles W. Killen, Piqua, and Robert W. Forward, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed June 11, 1973, Ser. No. 368,540**

**Int. Cl. H01q** *1/32*

**U.S. Cl. 343—713** **1 Claim**



1. In an automotive vehicle, the combination comprising: an instrument panel assembly having a top edge extending approximately horizontally across the interior width of the vehicle body; a conductive body structure forming a shield by which radio waves are normally prevented from entering the vehicle, the body structure including a windshield opening having a lower edge extending approximately horizontally across the exterior width of the vehicle body generally parallel to and spaced forward of the top edge of the instrument panel assembly and having an upper edge extending approximately horizontally across the exterior width of the vehicle body generally parallel to and spaced rearward of the lower edge of the windshield opening so that radio waves directed downward through the windshield opening from outside of the vehicle body pass through an irradiated space defined between the lower edge of the windshield opening and the top edge of the instrument panel assembly; a radio receiver mounted within the instrument panel assembly; a top portion of the instrument panel assembly extending within the irradiated space and including a nonconductive rigid inner layer, a nonconductive pliable outer layer, a nonconductive resilient intermediate layer interposed between the inner and outer layers, and a conductor physically disposed within the intermediate layer between the inner and outer layers for inductively collecting passing radio waves to provide an antenna which is protected from potentially damaging forces outside of the vehicle and which does not detract from the aesthetic appearance of the vehicle; and a transmission line for coupling the radio receiver to a point on the antenna conductor at which the output impedance of the antenna conductor is approximately matched to the input impedance of the radio receiver thereby to maximize the electrical efficiency with which radio waves are transferred from the antenna conductor to the radio receiver and wherein the close proximity of the antenna conductor to the radio receiver minimizes the length of the transmission line such that the amount of signal antennuation and impedance mismatch produced by the relatively small impedance of the transmission line is negligible.

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**3,896,449**

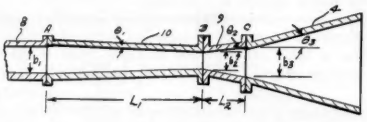
**APPARATUS FOR PROVIDING HIGHER ORDER MODE COMPENSATION IN HORN ANTENNAS**

**Alan E. Blume, Trotwood, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Division of Ser. No. 360,517, May 15, 1973, abandoned. This application Feb. 22, 1974, Ser. No. 445,048**

**Int. Cl. H01q** *13/00*

**U.S. Cl. 343—786** **2 Claims**



1. An $LSE_{12}$ mode compensated antenna comprising

a first rectangular waveguide segment having an inward E-plane flare, the input end thereof being adapted for connection to a rectangular waveguide transmission line, a second rectangular waveguide segment having an outward E-plane flare having its nonflared end connected to the output end of a said first waveguide segment, and

a rectangular antenna horn having an outward E-plane flare connected at its input end to the flared end of said second waveguide segment,

said second waveguide segment having length and flare angle values that effect the generation and phase reversal of $LSE_{12}$ mode power.

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**3,896,450**

**HARDENED ANTENNA ELEMENT COVER**

**Nancy D. Fitzroy, Schenectady; Ronald L. Mann; Henry B. Gerling, both of North Syracuse, and John D. Reale, Syracuse, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Sept. 23, 1974, Ser. No. 508,584**

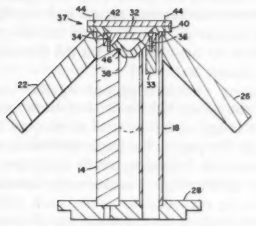
**Int. Cl.[2] H01Q** *1/42*

**U.S. Cl. 343—797** **2 Claims**

1. In an antenna element including a pair of dipole assemblies, cover means for protecting said element against rain and thermal radiation comprising:

a. a frusto-conical member mounted on top of said dipole assemblies; and,

b. an upper plate mounted on top of said frusto-conical member;




c. said plate and said frusto-conical member comprised of polytetrafluoroethylene filled laminated fiberglass.

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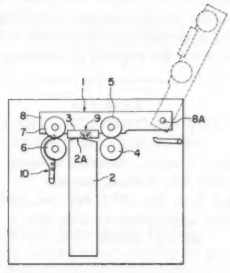
**3,896,451**

## ELECTROSTATIC RECORDING APPARATUS WITH AUTOMATIC MOVEMENT OF THE RECORDING ELECTRODES BETWEEN A RECORDING AND A NONRECORDING POSITION

**Kyoji Omi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Mar. 23, 1973, Ser. No. 344,137**
**Claims priority, application Japan, Apr. 12, 1972, 47-36103**
**Int. Cl. G01d** *15/16;* **G03g** *15/22*
**U.S. Cl. 346—74 ES** **9 Claims**




1. An electrostatic recording apparatus comprising means for moving a recording sheet along a defined path, recording electrode means disposed at the other side of the path, means for supporting the electrode means, means for detecting the presence of a recording sheet at a defined portion of said path to provide control signals in response to detecting the presence of a sheet at said defined portion of the path, means responsive to the said control signals from the detecting means for causing the support means to maintain the two electrode means at a recording position adjacent and facing each other across said path when a sheet is present at said defined portion of the path and to maintain the two electrode means at a nonrecording position away from each other when no sheet is present at said defined portion of the path and to move the electrode means between said two positions, said defined portion of the path including the path portion which is between the two electrode means when the electrode means are at their recording position, wherein the detecting means comprises first sensor means disposed in the path of the recording sheet preceding at least one of the electrode means and second sensor means disposed in the path of the recording sheet after at least one of the electrode means, as seen in the direction of movement of the recording sheet along said path, each of said sensor means being actuated by the presence of a recording sheet at its location, said sensor means providing said control signals when actuated.

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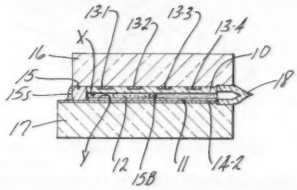
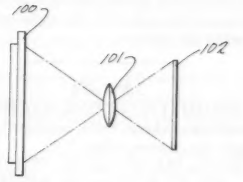
**3,896,452**

## RECORDING OF INFORMATION FROM GASEOUS DISCHARGE DISPLAY/MEMORY PANEL

**Felix H. Brown, Ann Arbor, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Continuation-in-part of Ser. No. 101,102, Dec. 23, 1970, Pat. No. 3,821,748. This application Mar. 11, 1974, Ser. No. 449,891**
**Int. Cl. H01j** *61/33;* **G01d** *15/06;* **H05h** *41/44*
**U.S. Cl. 346—74 P** **12 Claims**



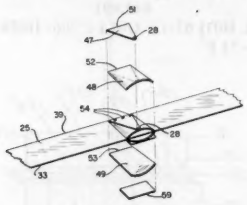




1. In the operation of an apparatus comprising in combination a gaseous discharge display/memory panel and an image recording device, said panel being characterized by an ionizable gaseous medium in a gas chamber formed by a pair of dielectric material members having opposed charge storage surfaces, which dielectric material members are capable of transmitting light therethrough and are respectively backed by a series of parallel-like electrode members, the electrode members behind each dielectric material member being transversely oriented with respect to the electrode members behind the opposing dielectric material member so as to define a plurality of discrete discharge volumes, each of which constitutes a discharge unit, and wherein the gas is selectively ionized within each discharge unit by operating voltages applied to the transversely oriented electrode members, said image recording device being characterized by a photosensitive surface facing one of said dielectric material members for directly receiving and recording an image, the improvement which comprises generating an image comprised of one or more gaseous discharge units such that image radiation is emitted from the discharge units in opposite directions through both said dielectric material members, said image emerging through said one dielectric material member being received by one side of a photoconductive material thereby causing a charge pattern corresponding to the image to be deposited onto a dielectric-coated, electrically conductive paper positioned on the opposite side of the photoconductor, when an electric field is applied across the array of photoconductor and paper.

## 3,896,453
## SPRING LOADING FOR THE STYLUS OF A PRESSURE-ENSITIVE CHART RECORDER

Richard S. Kampf, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 344,498, March 26, 1973, Pat. No. 3,852,769. This application Oct. 9, 1973, Ser. No. 404,302
Int. Cl. G01d *15/00*
U.S. Cl. 346—139 C 10 Claims



1. An improved chart recorder of the type having a pressure-sensitive chart longitudinally movable between a backing plate and a transparent front plate and a stylus-carrying strip movable transversely to the direction of chart movement between said chart and one of said plates, wherein the improvement comprises:

upper and lower arch springs secured to opposite sides of the stylus-carrying strip with the stylus means secured to one of said arch springs.

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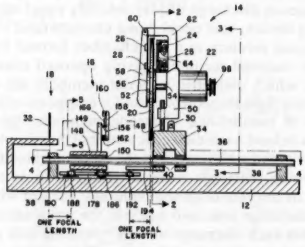
## 3,896,454
## PHOTOTYPESETTING MACHINE

Harry L. Hosterman, Akron, Ohio, assignor to Portage Newspaper Supply Co., Akron, Ohio

Division of Ser. No. 171,941, Aug. 16, 1971. This application Feb. 27, 1974, Ser. No. 446,488
Int. Cl. B41b *15/08*
U.S. Cl. 354—15 2 Claims



1. In a phototypesetting machine having:

a mechanism for holding a sheet of photographic paper in a plane and for advancing the paper along the plane;

a disc having at least one ring of negative images of type characters and an identifying mark for each image of the ring, the disc being parallel to but spaced from the plane of the paper;

a motor for rotating the disc;

a strobe light on the opposite side of the disc from the paper;

a lens between the paper and the disc and on the optical axis from the strobe light to the paper;

a light source for illuminating the identifying marks of the disc in sequence as the disc is rotated;

photoelectric sensing means for translating the illuminated identifying marks into electrical signals;

means to select an individual character, the means producing an electrical signal identifying the selected character;

a match detector for comparing the signal produced by the photoelectric sensing means and the signal from the selecting means to indicate when the selected character corresponds to the character on the disc detected by the sensing means; and

a strobe firing circuit triggered by the match detector whereby the strobe light is fired to illuminate the selected character image of the disc and project the image through the lens to the paper, the improvement comprising:

a character width indicating mark upon the disc for each character of the ring, an additional photoelectric sensing means being provided to sense each width indicating mark and produce an electrical signal corresponding to the width of the associated character, and circuit means receiving the signal from the additional sensing means for controlling the mechanism for advancing the paper to advance the paper a distance proportional to the width of the projected character,

said circuit means including an oscillator, an arithmetic updown register, a gate controlled by the additional photoelectric sensing means for supplying a pulse train proportional in length to the character width from the oscillator to the register to cause the register to count up, and a pulse generator responsive to movement of the paper to generate a pulse train proportional in length to the amount of paper advanced, the pulse train from the pulse generator causing the register to count down, wherein the paper advancing mechanism includes a second motor, a drive capstan driven by the motor and engaging the paper to advance the same and an electromagnetically operated brake operative to engage the paper and prevent its movement, the circuit means controlling the brake, the brake being controlled by the register whereby the brake is released while the register is counting down.

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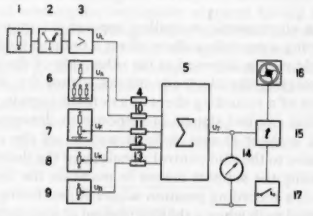
## 3,896,455
## APPARATUS FOR CONTROLLING THE EXPOSURE OF PHOTOGRAPHIC FILM

Alfred Steinbatz, Vienna, Austria, assignor to C. Reichert Optische Werke AG, Vienna, Austria

Filed Nov. 29, 1973, Ser. No. 420,355
Claims priority, application Austria, Dec. 1, 1972, 10218/72
Int. Cl.[2] G03B *7/08, 17/16*
U.S. Cl. 354—24 2 Claims



1. A control for determining exposure time for photomicrographic apparatus and operating the shutter of said apparatus responsive to the influence of photographic environment such as camera format, film sensitivity and light flux comprising:

means for generating an electrical signal responsive to the light flux adjacent a photographic subject including means for detecting light adjacent said subject, means for generating an electrical signal proportional thereto and means for converting said electrical signal to a second electrical signal proportional to the value of an exponent of a predetermined base value of said light value;

means for generating an electric signal responsive to the format of said photographic apparatus including means for generating an electrical signal proportional to the value of an exponent of said predetermined base value of said format signal;

means for generating an electric signal responsive to the sensitivity of the film of said photographic apparatus including means for generating an electric signal proportional to the value of an exponent of said predetermined base value of said sensitivity signal;

means for generating an electric signal responsive to the change of sensitivity of the film of said photographic apparatus including means for generating an electric signal proportional to the value of an exponent of said predetermined base value of said change of sensitivity signal;

means electrically connected to said exponential electric signal generating means for summing said signals including means for generating an output electric signal proportional to said sum; and

means for displaying the relative value of said output signal and means connected to said output signal and said shutter for driving said shutter responsive to said output signal.

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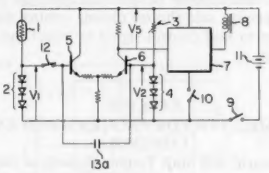
## 3,896,456
## ELECTRONIC SHUTTER WITH MEMORY FUNCTION

**Kenji Toyoda, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Apr. 2, 1974, Ser. No. 457,179**
**Claims priority, application Japan, Apr. 10, 1973, 48-42902**
**Int. Cl. G03b** *7/08*
**U.S. Cl. 354—24** **2 Claims**




1. In an electronic shutter circuit having:

a light measuring circuit for producing an output voltage in logarithmic proportion to the intensity of light passed from an object through an objective lens;

a second circuit means for producing an output voltage in logarithmic proportion to at least one exposure factor;

a memory capacitor for storing a voltage related to said output voltage of said light measuring circuit;

a memory switch for connecting said memory capacitor to said measuring circuit, and means for opening said memory switch before the shutter is opened;

a differential amplifier including a first input terminal connected to the output terminal of said measuring circuit through said memory switch and a second input terminal connected to the output terminal of said second circuit; control circuit means for controlling an exposure time in response to the output of said differential amplifier, said control circuit means including a magnet and a further switch for connecting said magnet to a power source, and means for closing said further switch after said memory switch is opened,

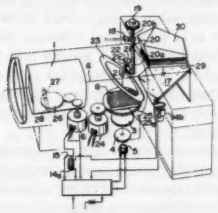
said capacitor being connected between said first and second input terminals of said differential amplifier,

whereby said memory capacitor stores the difference between the output voltages of said measuring and second circuits and after said memory switch is opened the output voltage of said differential amplifier is determined solely by the voltage stored in said memory capacitor.

## 3,896,457
## AUTOMATIC FOCUSING DEVICE

**Akio Yamanishi, and Yasuo Yamazaki, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 29, 1973, Ser. No. 420,337**
**Claims priority, application Japan, Dec. 7, 1972, 47-122034**
**Int. Cl. G03b** *3/10*
**U.S. Cl. 354—25** **15 Claims**



1. An automatic focussing device comprising:

an objective lens;

a focus detecting plane for detecting a focus of an image to be formed through said objective lens;

a focussing prism member disposed at said focus detecting plane including a first area having a light refracting characteristic and a second area having a light refracting characteristic different from that of said first area;

means for cyclically reciprocating said prism member along said detecting plane in a direction perpendicular to the boundary between said areas to vary the refraction of said image;

a photoelectric element disposed rearwardly of said focussing prism member on the geometrical extension of the optical axis of said objective lens and having a light receptive surface;

a relay lens disposed between said focussing prism member and said photoelectric element which are positioned on said extension of optical axis, and focussing light of an image to be formed through said objective lens adjacent to a plane including said light receptive surface; and

means for shifting said objective lens along the optical axis thereof so as to decrease AC output components from said photoelectric element which are responsive to the light incident thereon.

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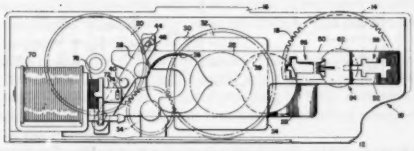
## 3,896,458
## AUTOMATIC EXPOSURE CONTROL SYSTEM

**Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Continuation of Ser. No. 376,513, July 5, 1973, abandoned.**
**This application Aug. 5, 1974, Ser. No. 494,994**
**Int. Cl. G03b** *7/08, 7/16, 9/42*
**U.S. Cl. 354—30** **21 Claims**



1. A photographic exposure control system for exposing, during a given flash illumination interval, photographic film located at a given film plane, said system comprising a variable lens assembly for directing image carrying rays from a scene along a given exposure path and for focusing such rays on such

photographic material, and control means for controlling the instantaneous amount of light rays passing from such scene along such exposure path during an exposure cycle and for defining a related time interval during which such instantaneous amount of light is passed along such exposure path so as to provide an exposure interval and thereby determine the total amount of light passed to such film during such exposure cycle and, in response to focusing of said lens assembly, for determining a unique relationship between said instantaneous defining means and said exposure time interval defining means so as to provide an optimized exposure at selected subject distances, such relationship being varied at an intermediate subject distance so as to provide an exposure interval utilizing almost all of the flash interval and greater than the amount of flash interval utilized at focus settings for subject distances at least slightly less than or slightly greater than such intermediate distance so as to preclude over exposure of subjects at this intermediate distance.

8. A photographic exposure control system for exposing with flash illumination photographic material located at a given film plane, said system comprising a variable lens system for directing image carrying rays along a given exposure path from a scene and focusing such rays on such material, selectively operable shutter means for blocking and unblocking such exposure path, means for actuating said shutter means to unblock said path so as to initiate an exposure cycle, a light sensitive element configured for automatically actuating said shutter means to block said exposure path responsive to the brightness of such scene following initiation of an exposure cycle, said shutter means including means for determining a primary aperture opening of given size within a given range for control of the instantaneous amount of light passed to such film and for determining a secondary aperture opening of given size within a given range for control of the instantaneous amount of scene light emitted to said light sensitive element, follow-focus means responsive to selected focusing of said lens for selecting a given size of said main and said secondary apertures, said follow-focus means including means for determining said apertures over a first range of values for near to intermediate subject distances and a second range of values for intermediate to far subject distances.

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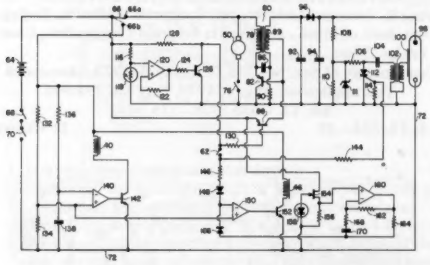
## 3,896,459
## CONTROL CIRCUIT FOR AN AUTOMATIC PHOTOGRAPHIC CAMERA

**Francis T. Ogawa, Lakewood, and John D. Wallace, Denver, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed May 29, 1974, Ser. No. 474,353**
**Int. Cl. G03b** *15/05, 7/08*
**U.S. Cl. 354—31** **5 Claims**



1. In an automatic camera featuring a plurality of automatic control functions including an electronically controlled shutter, an automatic film advance means, an automatic shutter reset means and an electronic flash unit, a control system for controlling the sequence and actuation of said control functions, said control system comprising:

a sequence initiate switch means having a reset condition and an actuated condition, said switch being operable to selectively connect portions of said control system to an energy source means,

an oscillator circuit means for energizing said electronic flash unit, said oscillator circuit means being coupled to the energy source means through said reset condition of said sequence initiate switch means;

a first light sensing circuit for sensing the intensity of ambient light,

first signal means responsive to said first light sensing circuit for producing a signal having a first signal level when said ambient light is below a predetermined value and a second signal level when said ambient light is above said predetermined value,

oscillator control means responsive to said signal from said first signal means, said oscillator control means being operative to enable said oscillator circuit means to be responsive to said first signal level and to block said oscillator circuit means from being responsive to said second signal level,

a shutter opening control circuit operative to introduce a momentary delay in the initiation of opening of the shutter, said shutter opening control circuit being coupled to the energy source means through said actuated condition of said sequence initiate switch means,

a shutter closing control circuit operative to selectively delay the closure of the shutter, said shutter closing control circuit being coupled to the energy source means through said actuated condition of said sequence initiate switch means,

a second light sensing circuit for sensing the amount of light admitted through the opening of the shutter, and

second signal means responsive to said second light sensing circuit to produce a control signal representative that a predetermined amount of light had admitted through the shutter opening, said shutter closing control circuit being responsive to said control signal to effect the closure of the shutter.

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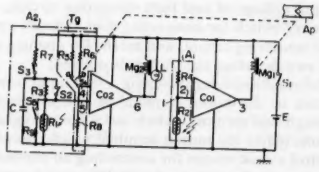
## 3,896,460
## ELECTRIC SHUTTER FOR PROGRAMMED EXPOSURE CONTROL

**Masayoshi Sahara, and Sinji Tominaga, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 31, 1973, Ser. No. 393,584**
**Claims priority, application Japan, Aug. 31, 1972, 47-101939**
**Int. Cl. G03b** *7/08*
**U.S. Cl. 354—38** **4 Claims**



1. Exposure control apparatus for programmed exposure control of a camera according to the intensity of scene illumination, said exposure control apparatus comprising:

a. light responsive means responsive to the intensity of the scene illumination for providing first and second output signals corresponding thereto, said light responsive means including means for providing an output level which changes in one direction from an initial level at a ratio determined by said second output signal, from initiation of the exposure;

b. first drive means actuable for facilitating the setting of the lens aperture of the camera between a first relatively large aperture and a second relatively small aperture;

c. first switching means responsive to the first output signal representative of a scene illumination above a predetermined level for actuating said first drive means to set the lens aperture from said first relatively large aperture to said second relatively small aperture and responsive to the first output signal representative of a scene illumination below said predetermined level for actuating said first drive means to set the lens aperture from said second relatively small aperture to said first relatively large aperture;

d. second drive means for terminating the exposure interval of the camera shutter;

e. second switching means for actuating said second drive means, said second switching means actuating said second drive means when said output level from the providing means traverses a variable threshold value, said first drive means setting the variable threshold value of said second switching means to a level relatively near said initial level when the lens aperture of the camera is set at its relatively large aperture opening and setting the variable threshold value to a level relatively far from said initial level when the lens aperture of the camera is set at its relatively small aperture opening.

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**3,896,461**

## CAMERA EXPOSURE CONTROL SYSTEM HAVING A DAMPING COIL

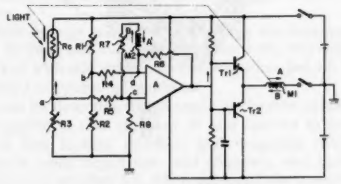
**Toyonori Higuma, Tokyo, Japan, assignor to Kabushiki Kaisha Yashica, Tokyo, Japan**

**Filed Dec. 20, 1973, Ser. No. 426,586**

**Claims priority, application Japan, Dec. 30, 1972, 47-459**

**Int. Cl. G03b** *7/10, 9/02, 19/18*

**U.S. Cl. 354—44** **4 Claims**




1. In a control system for adjusting the size of the aperture of a camera lens diaphragm so as to provide automatic exposure control, the combination comprising:

a servomotor, including a drive coil, for driving the diaphragm to adjust the aperture size under control of a drive signal supplied to the drive coil;

first circuit means for providing first and second voltage signals whose relative magnitude is indicative of whether the aperture size should be increased or decreased for proper exposure, the first circuit means including a bridge circuit having first and second bridge output terminals, the bridge circuit including a photoelectric circuit element connected in one arm of the bridge circuit for sensing light passing through the aperture and, in response thereto, causing the bridge circuit to provide the first and second voltage signals on the first and second bridge output terminals respectively;

a damping coil, magnetically coupled to respond to movement of the diaphragm, for providing a damping signal; and

second circuit means for combining the damping signal and the first and second voltage signals to form the drive signal so as to control the servomotor in driving the diaphragm without substantial vibration;

the second circuit means including an operational amplifier having a non-inverting input terminal coupled to respond to the first voltage signal, an inverting input terminal coupled to respond to the second voltage signal, and an amplifier output terminal coupled to the drive coil; negative feedback circuit means connected to the operational amplifier so that the non-inverting and inverting input terminals operate with virtually no voltage therebetween; and

the damping coil being connected in series-circuit relationship between the non-inverting and inverting input terminals.

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**3,896,462**

## EXPOSURE VALUE CORRECTING DEVICE IN AN INTERCHANGEABLE LENS CAMERA PROVIDED WITH A TTL EXPOSURE METER

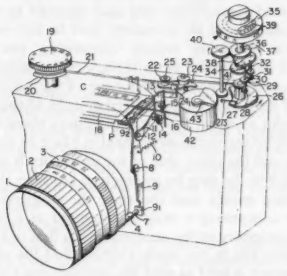
**Tatsuya Taguchi, Tokyo, and Yukio Iura, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 24, 1973, Ser. No. 391,343**

**Claims priority, application Japan, Sept. 1, 1972, 47-102576**

**Int. Cl. G03b** *7/20*

**U.S. Cl. 354—46** **5 Claims**



1. A camera equipped with an interchangeable lens and arranged for viewfinding and photometry at maximum lens aperture, comprising:

an aperture preset control means on said lens coupled with said camera;

an indicating member on said lens having a dimension indicative of the maximum value of the relative aperture of said lens;

a viewfinder;

a through-the-lens photometry system including a meter having a meter body and a pointer and also including means responsive to light received through said lens for actuating the meter in accordance with light quantity so received, the position of said pointer being visible in said viewfinder;

displaceable relative aperture scale means mounted in said viewfinder for indicating with reference to said pointer an aperture preset value to be used;

means responsive to said dimension of said indicating member of said lens for shifting said scale means so that the scale division thereof corresponding to the maximum relative aperture of the lens is at a predetermined position in the camera;

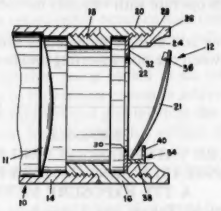
means responsive to the extent of displacement of said scale shifting means beyond a predetermined displacement thereof for applying to said photometry system a correction for the vignetting effect that occurs in lenses having a maximum relative aperture value greater than a a predetermined value.

3,896,463

## ACCESSORY MOUNTING APPARATUS FOR CAMERA

Donald M. Laskey, 2143 Wealthy S.E., Grand Rapids, Mich. 49506

Filed Jan. 2, 1974, Ser. No. 429,511
Int. Cl. G03b 17/12
U.S. Cl. 354—122 6 Claims



1. Apparatus for mounting accessories in the form of solid, non-magnetic disc members on the barrel of a camera comprising:

an annular ring formed of magnetically permeable material mounted on the end of the camera barrel;

mechanical retaining means positioned adjacent the outer surface of the annular ring and adapted to engage and hold one side of an accessory next to the ring, the mechanical retaining means comprising pocket means formed adjacent the outer surface of the annular ring and adapted to receive an outer edge of the accessory;

magnetic mounting means affixed directly to each accessory at a point adjacent the outer periphery thereof, such that one side of the accessory is held in place by said retaining means and the other side of the accessory is magnetically attached to the ring by interaction between the magnetic mounting means and the ring, the magnetic mounting means comprising a magnet mounted at a point on the outer periphery of the accessory such that one edge of the accessory fits in the pocket means and the other side of the magnet is held against the annular ring by interaction of the magnet and the annular ring.

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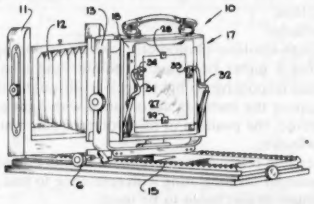
3,896,464

## HOLDING MEANS FOR HOLDING A ROLL OR SHEET FILM HOLDER IN PRESS AND VIEW CAMERAS

James Murry Galvin, 920-47th St., Sacramento, Calif. 95819

Filed May 13, 1974, Ser. No. 469,077
Int. Cl. G03b 17/44
U.S. Cl. 354—161 13 Claims



1. In a roll, sheet or Polaroid film holder holding means for a press or view camera or the like wherein said holding means includes a back panel, a focusing panel, cooperating means on both the back panel and the focusing panel for connecting said focusing panel to said back panel and urging said focusing panel against said back panel while permitting said focusing panel to be moved away from said back panel to allow the insertion of a roll or sheet or Polaroid film holder between said focusing panel and said back panel wherein said roll film holder is substantially greater in thickness than said sheet or Polaroid film holder, said focusing panel having a ground glass opening therein aligned with an opening in said back panel when said focusing panel is urged against said back panel, the improvement which comprises:

said cooperating means includes a pair of arms, one of said arms being pivotally connected at one end to one side of said back panel and at the other end pivotally connected to said focusing panel on the side opposite the side thereof adapted to abut said back panel, the other of said arms being pivotally connected at one end to the opposite side of said back panel and at the other end pivotally connected to said focusing panel, on the side opposite the side thereof adapted to abut said back panel, and tensioning means associated wiht each of said arms, each of said tensioning means being operatively connected at one end to said back panel and at the other end to said respective arm, wherein said back panel includes a guide having at least a pair of spaced elongated guide members disposed on each side of the opening in said back panel and spaced therefrom, said focusing panel being retained between said elongated guide members when said focusing panel is in abutting engagement with said back panel.

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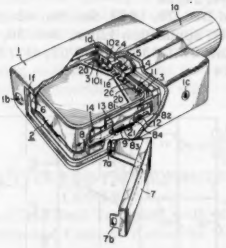
3,896,465

## CAMERA USING A FILM MAGAZINE

Tomoshi Takigawa, and Yoshio Komine, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 251,002, May 8, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,434
Int. Cl.[2] G03B 19/10
U.S. Cl. 354—174 7 Claims



1. A camera system comprising:

A. a film magazine accommodating a film therein, said magazine having two face sides and having peripheral sides substantially perpendicular to said face sides and including

a. an opening for exposing the film provided in a first peripheral side of said magazine,

b. first and second recesses both provided on a first face side of said magazine, located near its junction with said first peripheral side so as to leave walls respectively between said recesses and said first peripheral side and located on opposite sides of and spaced from the center of said first peripheral side,

c. at least first and second signal applying portions symmetrically provided on said first peripheral side of said magazine, said first signal applying portion including first cut-away portion means for signaling the sensitivity of the film accommodated in said magazine, and said second signal applying portion including second cut-away portion means for signaling the type of film accommodated in said magazine, said first and second cut-away portion signaling means being respectively cut-away portions of said walls respectively between said first and second recesses and said first peripheral side, but in each case occupying only a part of said wall and leaving a substantial length thereof unaffected, and

d. an index recess provided in said first peripheral side, constituting also a recess in said first face side and located substantially midway between said first and second recesses; and

B. a camera including,

a. driving means for feeding the film accommodated in said magazine,

b. a photographic optical system for focusing light from an object to be photographed on an image forming plane,

c. a filter selectively disposed across the optical path of said photographic optical system,

d. a chamber for accommodating said film magazine and having an opening provided at the rear of said camera for loading or unloading said film magazine, said chamber being provided with an opening for permitting the exposure of the film on a first side of said chamber which side corresponds to said first peripheral side of said magazine,

e. a cover for selectively covering said rear opening of said chamber for loading or unloading,

f. an index member for positioning in place said magazine within said chamber by engaging with said index recess of said magazine, said index member projecting into said chamber of said camera,

g. means for sensing the sensitivity of the film accommodated in said chamber, said film sensitivity sensing means being provided with a plurality of switching members for on-off control in response to the sensing of said first cut-away portion means of said magazine for signaling film sensitivity, which members are provided adjacent the location of said first signal applying portion of said magazine when in said chamber,

h. means for sensing the type of the film accommodated in said magazine, said film type sensing means being provided with a detecting member for controlling said filter in response to the presence or absence of said second cut-away portion signaling means of said magazine,

i. a film footage counter for indicating the consumption of the film, said counter being selectively mechanically linked with said driving means, and when linked, being placed in operating condition,

j. means for detecting the presence or absence of said film magazine in said chamber of said camera to actuate said film footage counter, said magazine detecting means being urged into said chamber, and having a detecting member for, when detecting the presence of said magazine accommodated in said chamber, causing said counter to be mechanically linked with said driving means,

k. a first resilient member for resiliently urging said magazine against said first side of said chamber, said first resilient member having resilient segments for engaging with said first and second recesses of said magazine over the portion of said walls unaffected respectively by said first and second signal applying portions of said magazine,

l. a second resilient member for cooperating with said first resilient member to hold said magazine within said chamber, said second resilient member being disposed within said chamber and applying a resilient force in the direction substantially perpendicular to that of the second resilient member, and

m. releasing means for permitting the unloading of said magazine from said chamber through said opening of said chamber provided at the rear of the camera, said releasing means having a sliding member provided with an engaging portion engageable with a portion of said magazine to permit the removal of said magazine and an operating portion for permitting movement of said engaging portion when said cover is opened;

whereby, when said magazine is accommodated within said chamber, said magazine is held in place regardless of the position of said cover, and camera setting corrections responsive to the film sensitivity and control of the filter are automatically effected.

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**3,896,466**

## CONTROL MECHANISM FOR VARIFOCAL OBJECTIVE

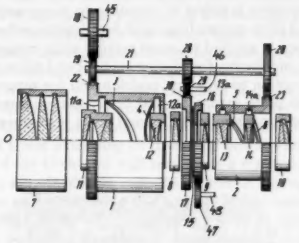
**Heinz Korpert, Bad Kreuznach, Rhineland, Germany, assignor to Jos. Schneider & Co., Bad Kreuznach (Rhineland), Germany**

**Filed Dec. 5, 1973, Ser. No. 421,931**

**Claims priority, application Germany, Dec. 6, 1972, 2259723**

**Int. Cl. G03b** *5/02*

**U.S. Cl. 354—196** **11 Claims**



1. A varifocal objective comprising:

a front lens group centered on an axis including a first pair of shiftable components each movable along said axis at a rate different from that of the other component;

a rear lens group coaxial with said front lens group including a second pair of shiftable components each movable along said axis at a rate different from that of the other component;

a first rotable element;

first cam means operatively connecting said first rotatable element with said first pair of components;

a second rotatable element;

second cam means operatively connecting said second rotatable element with said second pair of components; and

a common control mechanism for all said components including a rotatable drive member mechanically coupled with both said elements for rotating same.

2. A varifocal objective as defined in claim 1, further comprising a diaphragm of variable aperture provided with adjusting means and coaxially interposed between said front and rear lens groups, said control mechanism being operatively coupled with said adjusting means for changing said aperture upon rotation of said second element.

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**3,896,467**

## COMPACT PHOTOGRAPHIC CAMERA

**Yoichi Hamada, Nishinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Aug. 14, 1973, Ser. No. 388,301**

**Claims priority, application Japan, Sept. 30, 1972, 47-98311**

**Int. Cl. G03b** *19/04*

**U.S. Cl. 354—204** **7 Claims**

1. A compact photographic camera which comprises in combination:

a housing structure including a viewfinder through which an object to be photographed is aimed at, a film chamber adapted to accommodate therein a roll of unexposed film, a film take-up chamber adapted to accommodate the roll of film after said film has been exposed and transferred from said film chamber thereto, said film having a plurality of equidistantly spaced film perforations along a por-

tion adjacent to at least one of the opposite lengthwise edges of said film, and a light passage through which said film is exposed;

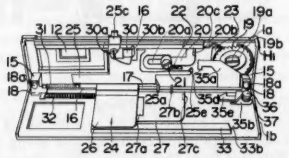
a lens assembly carried by said housing structure in alignment with said light passage;

a first plate means having an exposure aperture and being movable between inoperative and operative positions across the optical axis of said lens assembly with said exposure aperture traversing said optical axis of said lens assembly, said film being exposed only when said first plate means moves from said operative position to said inoperative position with said exposure aperture substantially aligned with said lens assembly;

a first means for biasing said first plate means in one direction to said inoperative position;

a second plate means movable between first and second positions, said first plate means being moved to said operative position in response to movement of said second plate means from said first position when an external force is applied to osaid second plate means;

a second means for biasing said second plate means in one direction to said first position and for returning said second plate means to said first position from said second position when said external force is removed;



a shutter release button;

means operatively associated with said shutter release button for engagement with said first plate means to permit the latter to be held in said operative position against said first biasing means when said first plate means is moved to said operative position, said operatively associated means being, when said shutter release button is depressed, capable of disengaging said first plate means thereby to permit the latter to move to said inoperative position;

means for advancing the film from said film chamber to said film take-up chamber, each time said film has been exposed, in response to the movement of said second plate means from said first position to said second position;

means for holding said second plate means at a position a predetermined distance preceding said first position during the movement of said second plate means from said second position to said first position;

and

means for completely returning said second plate means to said first position after said first plate means has returned from said operative position to said inoperative position.

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**3,896,468**

## APPARATUS FOR WET TREATMENT OF PHOTOGRAPHIC MATERIALS OR THE LIKE

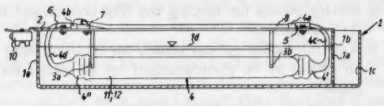
**Jurgen Muller, Munich, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany**

**Filed May 23, 1974, Ser. No. 472,899**

**Claims priority, application Germany, May 25, 1973, 2326679**

**Int. Cl. G03d** *13/00*

**U.S. Cl. 354—299** **10 Claims**

1. Apparatus for wet treatment of photographic sheets, webs or the like, comprising a vessel for a body of liquid, said vessel having means for maintaining the upper surface of the body of liquid therein below a predetermined level; and means for heating the body of liquid in said vessel, comprising at least one insulator consisting of brittle material, at least one electric resistance heating element confined in said insulator, a flexible hose sealingly surrounding said insulator and said heating

element therein, said hose having at least one end portion extending above said level, and electric conductor means extending through said one end portion of said hose and connected to said heating element.

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**3,896,469**

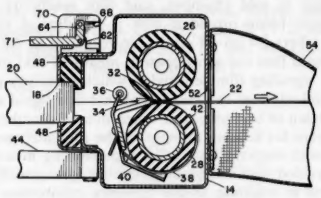
## PORTABLE RADIOGRAPHIC FILM PROCESSING APPARATUS

**Richard E. Mather, El Cajon, Calif., assignor to Teledyne, Inc., San Diego, Calif.**

**Filed Nov. 8, 1973, Ser. No. 414,172**

**Int. Cl.[2] G03D** *9/02*

**U.S. Cl. 354—304** **15 Claims**



1. Improvements in combination with a film processing apparatus of the type having a pair of opposed pressure-applying rollers in a housing for effecting distribution of a processing agent between a pair of liquid-confining layers of a film packet having a leading edge portion, an agent reservoir portion, a film accomodating portion, and a trailing edge portion, arranged in that order, said apparatus being adapted to receive the leading edge portion and successive portions of said film packet sequentially in pressure-bearing relationship until said trailing edge portion passes a terminal station just short of the point of entry between said rollers, said improvements comprising:

means movable into physical engagement with at least one of said rollers to positively prevent continued motion thereof upon passage of said trailing edge beyond said terminal station and prior to entry of said trailing edge between said rollers whereby expulsion of the processing agent through said trailing edge portion is prevented.

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**3,896,470**

## AUTOMATIC PROCESSOR FOR OFFSET PLATES

**John C. Hovekamp, Mansfield, Ohio, assignor to Buckler Industries, Inc., Mansfield, Ohio**

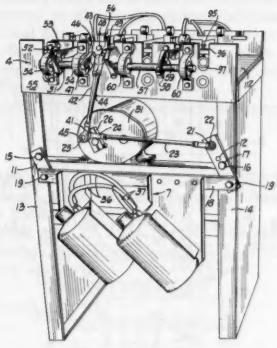
**Filed Apr. 11, 1973, Ser. No. 350,129**

**Int. Cl. G03d** *5/00, 3/04*

**U.S. Cl. 354—317** **9 Claims**

1. In a self-contained processor for processing an exposed surface of individual photolithographic plates sequentially and essentially continuously through developing, washing and gumming stages wherein conveyor means is adapted to receive and urge each of said plates under rubbing means in frictional contact with said exposed surface, and drive means is disposed in operative relationship with said rubbing means, said drive means including a first crank arm rotatable about a first axis, a stub shaft mounted on said first crank arm in spaced relation

with said first axis and having an axis extending parallel with said first axis, first and second drive shafts, each said drive shaft being mounted in spaced relation with said first and stub shaft axes for rotation about an axis extending transversely of said first and stub shaft axes, each said drive shaft having a crank arm thereon; nonrotatable first and second rubbing means extending parallel with each other and mounted to reciprocate rectilinearly, each on an axis extending in spaced parallel relation with said first and stub shaft axes, first and second direct rod means having ends, one end of each said



direct rod means being mounted on said stub shaft, the other end of said first and second rod means being mounted on said crank arm of said first and second drive shafts, respectively, in spaced relation with the said axis thereof whereby rotation of said stub shaft about said first axis oscillates said drive shafts about their axis, respectively, means and providing engagement between said first and second drive shafts and said first and second rubbing means, respectively, said last named means including means whereby each said rubbing means is reciprocated in response to said oscillation of said drive shafts, respectively.

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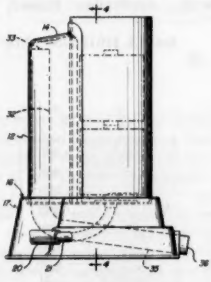
**3,896,471**

## FILM WASHER

**George L. Najarian, 6991 Mulberry St., Hanover Park, Ill. 60103**

**Filed Dec. 6, 1973, Ser. No. 422,177**
**Int. Cl. G03d** *3/02*
**U.S. Cl. 354—324** **1 Claim**



1. A washing tank for film on supports which includes, in combination,

an open top water tank member having a size to accommodate a film support means for said film,

an auxiliary water container mounted alongside and to the open top water tank, the wall of said water tank also being a wall for said water container, said auxiliary water container having a closed top adjoining the open top of the tank, a bottom water port communicating the interior of the tank and container,

a base member supporting said water tank and container, said base member having a continuous skirt extending from the bottoms of the water tank and container,

an angular siphon tube, a vertical branch positioned within the auxiliary container, said vertical branch having an open end positioned immediately below the closed top of the auxiliary water container and said vertical branch extending through the bottom of the water container, a horizontal branch of the siphon tube extending through said base member below the water container and the water tank, and said horizontal branch extending through the skirt and having a discharge end outside said skirt,

a bottom fill opening in the water tank, water fill means extending through said skirt for mounting to a water tube to convey water to said bottom fill opening, and

a baffle member water deflector inside the tank positioned over said bottom fill opening, said baffle member having a U-shaped raised wall bordering the bottom fill opening and a cover extending over the top of the wall, the open end of the U-shaped wall serving as a water discharge to direct entering water radially relative to the vertical axis of the tank and along the bottom of the tank to effect agitation of the water whereby the filled tank empties when the water level raises above the top of the siphon tube in the auxiliary water container through siphon action.

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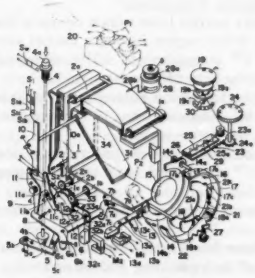
**3,896,472**

## AUTOMATIC EXPOSURE CONTROL DEVICE FOR USE IN A PHOTOGRAPHIC CAMERA

**Ichiro Yoshiyama, Kobe; Kayoshi Tsujimoto, Osaka, and Hiroshi Ueda, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 1, 1974, Ser. No. 456,826**
**Claims priority, application Japan, Apr. 3, 1973, 48-38083**
**Int. Cl. G03b** *7/00*
**U.S. Cl. 354—29** **13 Claims**



1. An automatic exposure control device for use in a photographic camera having an adjustable diaphragm aperture, comprising:

diaphragm aperture adjusting means for presetting said diaphragm aperture;

means for selecting the lowest shutter speed at which an exposure will not be effected by vibration of said camera;

a light measuring circuit including a photoconductive element and producing outputs which vary in response to said diaphragm aperture adjusting means and said means for selecting the lowest shutter speed;

detecting means for comparing the level of outputs produced by said light measuring circuit with the level set for a given output and detecting which level is higher;

an electromagnet actuated in response to said detecting means;

a diaphragm actuating member setting said diaphragm aperture from its fully open position to said preset diaphragm aperture prior to the commencement of exposure in association with the release operation;

means for interrupting operation of said diaphragm actuating member in response to said detecting means to retain the diaphragm in its fully open position; and

means for controlling the termination of exposure according to the scene light through an objective lens and the diaphragm from a photographic object to be photographed upon the commencement of exposure.

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**3,896,473**

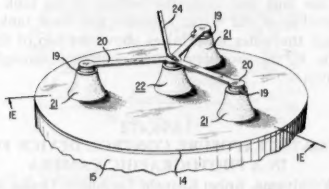
**GALLIUM ARSENIDE SCHOTTKY BARRIER AVALANCE DIODE ARRAY**

**James Vincent DiLorenzo, Piscataway; William Charles Niehaus, and Daniel Leon Rode, both of Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 4, 1973, Ser. No. 421,521**

**Int. Cl. H011** *1/12, 1/18*

**U.S. Cl. 357—15** **1 Claim**




1. A semiconductor power dissipating device consisting of at least three semiconductor bodies, arranged symmetrically around a centrally located inert semiconductor body, all of which semiconductor bodies are fabricated on a planar heat sink and comprise in sequence:

a. a Schottky barrier layer which contacts the heat sink;

b. a GaAs active region having a carrier concentration of about $10^{15}$ atoms/cm$^3$ to $10^{17}$ atoms/cm$^3$, and which contacts the Schottky barrier;

c. a GaAs buffer region having a carrier concentration of about $10^{17}$ atoms/cm$^3$ to $10^{18}$ atoms/cm$^3$, and which contacts the active region;

d. a GaAs contact region having a carrier concentration of about $10^{18}$ atoms/cm$^3$, and which contacts the buffer region;

e. an ohmic contact layer which contacts the GaAs contact region;

f. planar beam leads extending from the central inert body to each of the remaining bodies; and

g. an electrode bonded to a portion of the beam lead over the central body.

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**3,896,474**

**CHARGE COUPLED AREA IMAGING DEVICE WITH COLUMN ANTI-BLOOMING CONTROL**

**Gilbert F. Amelio, Saratoga, and Rudolph H. Dyck, Palo Alto, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.**

**Filed Sept. 10, 1973, Ser. No. 395,663**

**Int. Cl.[2] H01L** *27/14*

**U.S. Cl. 357—24** **10 Claims**

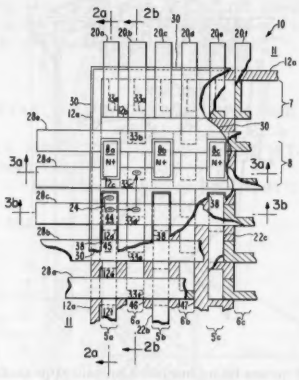
1. A charge coupled area imaging device having anti-blooming control, which device comprises:

a. a semiconductor substrate of a first conductivity type;

b. a plurality of parallel columns of light sensing elements associated with first portions of said substrate;

c. a first corresponding plurality of shift registers associated with second portions of said substrate, said shift regisiters being interdigitated between and parallel to said columns of light sensing elements and each shift register being arranged in a column;

d. means for transferring charge packets accumulated in said light sensing elements to appropriate positions in said first corresponding plurality of shift registers;




e. an output shift register disposed in a third portion of said substrate for receiving said charge packets from said firsst corresponding plurality of shift registers; and,

f. a second corresponding plurality of charge sink means for receiving excess charge, each of said charge sink means being located only adjacent to one end of a corresponding column of said first corresponding plurality of shift registers and to a corresponding position of said output shift register, whereby spreading of excess charge into said output shift register is controlled.

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**3,896,475**

**SEMICONDUCTOR DEVICE COMPRISING RESISTANCE REGION HAVING PORTIONS LATERAL TO CONDUCTORS**

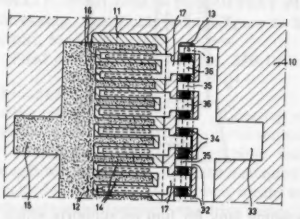
**Maurice Bonis, Herouville, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 323,847, Jan. 15, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,528**

**Claims priority, application France, Jan. 28, 1972, 72.02947**

**Int. Cl. H011** *5/00, 3/00*

**U.S. Cl. 357—35** **10 Claims**




1. A semiconductor device comprising:

a. a semiconductor body having a first surface;
b. a second conductivity type region located in said semiconductor body;
c. at least two active surface zones of a first conductivity type located at said semiconductor body and adjoining said region, said zones and said region forming respective p,n junctions terminating at said surface;
d. a substantially strip-shaped resistance region located at a portion of said surface removed from said zones and separated from remaining parts of said semiconductor body by a barrier layer, said resistance region comprising plural contact zones and at least one connection zone that are disposed at alternating spaced portions along the longitudinal direction of said resistance region;
e. plural conductive layers extending between and electrically connecting respective said surface zones and said contact zones; and
f. a connection conductor contacting said connection zones.

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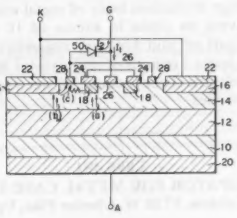
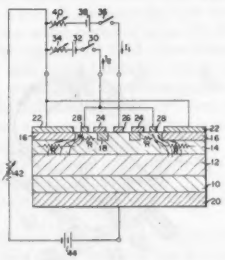
**3,896,476**
**SEMICONDUCTOR SWITCHING DEVICE**
**Akira Kawakami, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Apr. 23, 1974, Ser. No. 463,412**
**Claims priority, application Japan, May 2, 1973, 48-49538; May 16, 1973, 48-54478**
**Int. Cl. H01l 11/10**
**U.S. Cl. 357—38** **9 Claims**





1. A semiconductor switching device comprising: a first emitter layer of a first type conductivity, a first base layer of a second type conductivity disposed on said first emitter layer, a second base layer of said first type conductivity disposed on said first base layer, a second emitter layer of said second type conductivity disposed in a surface adjacent portion of said second base layer, an auxiliary emitter layer of said second type conductivity disposed in a surface adjacent portion of said second base layer and separated from said second emitter layer, an anode electrode disposed in ohmic contact with said first emitter layer, a cathode electrode disposed in ohmic contact with said second emitter layer, a first auxiliary gate electrode disposed in ohmic contact with the both said auxiliary emitter layer and one portion of said second base layer to bridge them, a second auxiliary gate electrode disposed in ohmic contact with said second base layer and interposed between said cathode electrode and said first auxiliary gate electrode, a gate electrode disposed in ohmic contact with said second base layer opposed to said first auxiliary gate electrode, said gate electrode being located on said second base layer on that side of said first auxiliary gate electrode remote from said second auxiliary gate electrode, and circuit means for applying a gate signal said gate electrode to turn the device on and for applying to said second auxiliary gate electrode a gate signal opposite in polarity to the firstmentioned gate signal to turn the device off.

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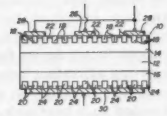
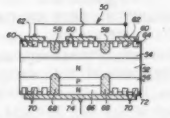
**3,896,477**
**MULTILAYER SEMICONDUCTOR SWITCHING DEVICES**
**Jearld L. Hutson, 907 Newberry, Richardson, Tex. 75080**
**Filed Nov. 7, 1973, Ser. No. 413,558**
**Int. Cl. H01e 11/10**
**U.S. Cl. 357—39** **30 Claims**



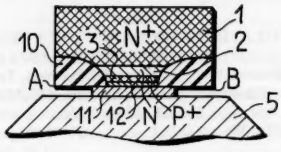


1. A semiconductor device comprising:
a body of semiconductor material having at least three layers including an internal layer of one conductivity type bounded on opposite sides by two layers of the opposite conductivity type to form a plurality of P-N junctions, said body having first and second opposed outer surfaces of said opposite conductivity type,
an array of discrete regions of said one conductivity type spaced apart over said first and second outer surfaces of said body; the cross sections of said discrete regions parallel to said outer surfaces being symmetrical and said discrete regions extending inwardly from said first and second outer surfaces into the interior of said layers of opposite conductivity type,
each of said discrete regions in said first outer surface being vertically aligned with a discrete region in said second outer surface, in order to substantially eliminate lateral current flow in said device during conduction upon the application of predetermined bias potential,
a first electrode in low resistance ohmic contact with the exposed surfaces of a plurality of said discrete regions and with a portion of said first outer surface,
a second electrode connected to a source of control bias and connected to said first outer surface and contacting a plurality of said discrete regions and spaced apart from said first electrode, and
a third electrode connected to said second outer surface.

## 3,896,478
## MESA TYPE JUNCTION INVERTED AND BONDED TO A HEAT SINK

Raymond Henry, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 308,334, Nov. 21, 1972, abandoned.
This application Feb. 14, 1974, Ser. No. 442,625
Claims priority, application France, Nov. 26, 1971, 71.42472
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 357—56 2 Claims

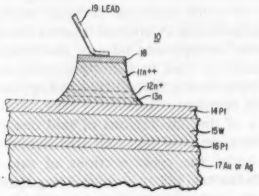



1. Semiconductor device comprising: one mesa type junction made upon a substrate, said junction having flank, and terminal having a top face, said flank being embedded by a dielectric material having an upper face in the same plane of said top face, said semiconductor device further comprising at least a metallic layer having a first face being integral with said top face and a second face opposite to said first face, said second face being bonded to a heat sink so that said upper face forms a shoulder.

## 3,896,479
## REDUCED STRESSES IN III-V SEMICONDUCTOR DEVICES

James Vincent Di Lorenzo, Piscataway, and George Arthur Rozgonyi, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 399,824, Sept. 24, 1973, abandoned. This application Mar. 4, 1974, Ser. No. 447,547
Int. Cl. H01l *5/00*
U.S. Cl. 357—71 10 Claims

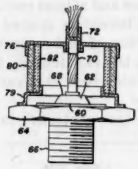



6. A III-V semiconductor device comprising:
a. a metal layer on a semiconductor surface; and
b. a heat sink layer of gold or silver on the metal layer,
characterized in that a multilayer structure is interposed between the metal layer and the heat sink layer, the multilayer structure comprising:
a. a tungsten layer, under compressive stress, formed and deposited on the metal layer by means of rf sputtering and compensating sufficiently for the stress of the metal layer so that the resultant radius of curvature is greater than 5 meters; and
b. a thin platinum layer formed on the tungsten layer.

## 3,896,480
## SEMICONDUCTOR DEVICE WITH HOUSING OF VARISTOR MATERIAL

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 191,870, Oct. 22, 1971, abandoned.
This application May 30, 1973, Ser. No. 365,323
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 357—80 7 Claims

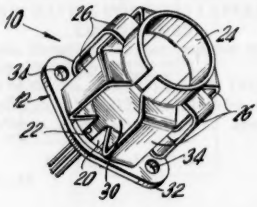



1. In combination with a semiconductor device including a body of PN junction semiconductor material having at least two contacts across which a voltage may be applied,
a housing for said body of semiconductor material, an excess-voltage protection body of metal oxide varistor material having an alpha in excess of 10 constituting an integral part of said housing, respective electrodes located on spaced regions of said varistor body, and means forming electrical connections between said contacts and said electrodes.

## 3,896,481
## HEAT DISSIPATOR FOR METAL CASE TRANSISTOR

Anthony D. Calabro, 8738 W. Chester Pike, Upper Darby, Pa. 19082

Filed July 2, 1974, Ser. No. 485,070
Int. Cl.[2] H01L *23/02*
U.S. Cl. 357—81 12 Claims

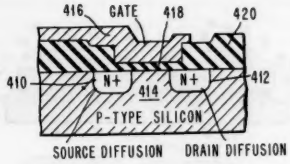


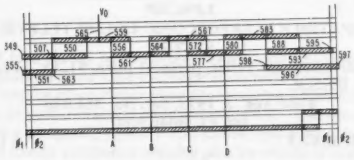

1. A heat dissipator for metal case transistors comprising:
a first annular collar which is split and is made of a metal material for engaging the case of the transistor;
a second split annular collar also made of a metallic material and spaced from said first collar; and
an intermediate array of spaced, U-shaped deflectors disposed between said first and second collars, said deflectors being made of a metallic material and operative to deflect air currents towards the region immediately above the case so as to increase the rate of heat convection from the case upwardly through the second annular collar.

## 3,896,482
## DYNAMIC MOSFET LAYOUT TECHNIQUE

George E. Brechling, Gaithersburg, and John J. Montren, Derwood, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 267,869, June 30, 1972, abandoned. This application June 27, 1973, Ser. No. 374,173
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 357—23 1 Claim



1. In an insulated gate field effect transistor integrated circuit logic function layout having a plurality of spaced parallel rows of diffusions of a first conductivity type in a semiconductor wafer of a second conductivity type with portions of said semiconductor wafer between adjacent diffusions defining input channel regions sof field offset transistor devices, selected ones of said parallel diffusion being segmented into reduced lengths, wherein the improvement comprises:

a first and third diffusion segment in a first row,

said first diffusion segment operating as a source diffusion in a first field effect transistor,

said third diffusion segment operating as a drain diffusion in a second field effect transistor,

a second diffusion segment in a second row adjacent to said first row,

said second diffusion segment operating as a drain diffusion in said first field effect transistor and as a source diffusion in said second field effect transistor,

each of said diffusion segments in said first row being partially juxtaposed with each of the nearest diffusion segments in said second row so as to define a sequence of channel regions bounded by an alternating sequence of diffusion segments,

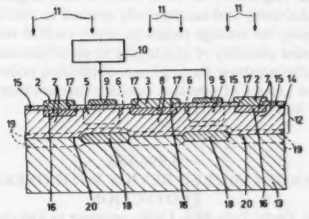
at least one gate electrode formed over the channel region defined by each juxtaposed pair of diffusion segments,

said first and second diffusion segments forming said first field effect transistor whose drain diffusion is series connected by means of said second diffusion to the source diffusion of said second field effect transistor which is formed by said second and said third diffusion segments, whereby a logical function is formed in a two dimensional, alternating series array, providing a high logic power per unit area.

## 3,896,483
## SWITCH

Maurice Vincent Whelan, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 19, 1973, Ser. No. 398,585
Claims priority, application Netherlands, Sept. 23, 1972, 7212912
Int. Cl. H01l *11/14*
U.S. Cl. 357—23 15 Claims

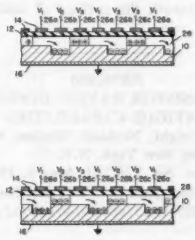


1. A time delay device comprising a field-effect transistor having a semiconductor body comprising spaced source and drain regions of one type conductivity defining therebetween a channel region of said one type conductivity and a gate electrode for controlling the conduction level of the channel region, said gate electrode when pulsed establishing a depletion region in the channel reducing the conduction in the channel to a low level, and means for automatically increasing the conduction in the channel to a high level after a controlled time interval, said conduction increasing means including a rectifying junction within the body and means connected to the rectifying junction for at least temporarily biasing same in the forward direction, said biasing value being such that carriers injected by the forward baised junction cause contraction of the depletion region and increased channel conduction at a controlled rate producing the high level channel conduction at the end of the controlled time interval.

## 3,896,484
## INTRINSIC SEMICONDUCTOR CHARGE TRANSFER DEVICE USING ALTERNATE TRANSFER OF ELECTRONS AND HOLES

Jun-ichi Nishizawa, No. 6-16, Komegafukuro 1-chome, and Termumoto Nonaka, c/o Mrs. Sadako Goto, No. 14-5, Otamaya-shita, both of Sendai, Japan

Continuation-in-part of Ser. No. 186,236, Oct. 4, 1971, abandoned. This application Feb. 6, 1974, Ser. No. 439,865
Claims priority, application Japan, Oct. 6, 1970, 45-87649
Int. Cl. H01l *11/14*
U.S. Cl. 357—24 9 Claims



1. A semiconductor data transmission device for transmitting groups of carriers each corresponding to digital data comprising: a substrate composed of intrinsic semiconductive material having a pair of opposite main faces; a layer com-

posed of electrically insulating material disposed on one of said main faces of said substrate; a plurality of metallic electrodes disposed in spaced-apart relationship in a predetermined pattern on the surface of the electrically insulating layer; a metallic electrode disposed on the main face of said substrate; means for selectively injecting both groups of positive polarity carriers and groups of negative polarity carriers successively into said intrinsic semiconductive substrate; and time delay means connected to said plurality of metallic electrodes disposed on the surface of said electrically insulating layer and responsive to both positive and negative voltage pulses selectively and successively applied to one end thereof for delaying the voltage pulses to apply each in succession to each of said plurality of electrodes to simultaneously transfer through the substrate those groups of positive polarity carriers and those groups of negative polarity carriers that have been injected into the substrate.

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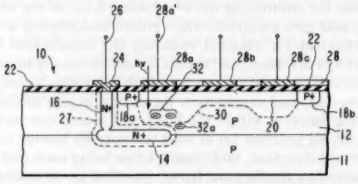
**3,896,485**

## CHARGE-COUPLED DEVICE WITH OVERFLOW PROTECTION

**James M. Early, Palo Alto, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.**

**Filed Dec. 3, 1973, Ser. No. 421,314**
**Int. Cl.[2] H01L** *27/14*
**U.S. Cl. 357—24** **8 Claims**




1. Structure which comprises:

a. a light sensing element comprising a first region of semiconductor material overlaid by a first electrode separated from said semiconductor material by insulation, said light sensing element being capable of containing a charge packet;

b. an adjacent region of said semiconductor material disposed for receiving said charge packet from said light sensing element;

c. means for controlling the transfer of said charge packet from said light sensing element to said adjacent regions; and,

d. charge sink means having a contact for applying a bias thereto buried within said semi-conductor material and disposed for receiving excess charge accumulated in said light sensing element, said charge sink means extending laterally from said contact toward said light sensing element while beneath the surface of said semiconductor material.

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**3,896,486**

## POWER TRANSISTOR HAVING GOOD THERMAL FATIGUE CAPABILITIES

**Jerome Edward Wright, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.**

**Continuation of Ser. No. 726,741, May 6, 1968, abandoned. This application June 3, 1971, Ser. No. 149,615**
**Int. Cl.[2] H01L** *23/48, 29/46, 29/62, 29/64*
**U.S. Cl. 357—67** **5 Claims**

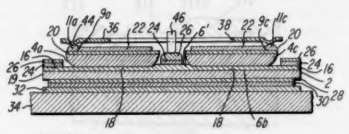
1. A transistor comprising:

a. a wafer of semiconducting material including emitter, base and collector regions;

b. said emitter region being of one conductivity type and being disposed adjacent a surface of said wafer, said emitter region being composed of a plurality of separate portions each of which comprises a trunk with pairs of lateral branches extending from a central area of said surface and said branches being of progressively increasing length toward the periphery of said surface;

c. a bonding pad at the periphery of each said trunk;

d. a base region of opposite conductivity type also adjacent said wafer surface, said base portion including said central surface area and having branches interdigitated with said emitter region branches;




e. an emitter contact electrode comprising a metal plate suspended above said wafer surface, said plate being connected only to each of said bonding pads, said plate having a central aperture, and;

f. a base contact electrode extending through said aperture connected to said central area base region portion.

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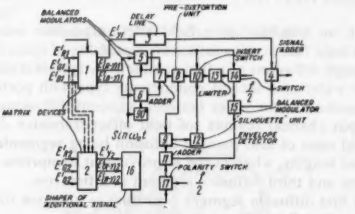
**3,896,487**

## COMPATIBLE STEREOSCOPIC COLOR TELEVISION SYSTEM

**Vladimir Efimovich Tesler, prospekt Mira, 91, kv. 120, Moscow, U.S.S.R.**

**Filed Aug. 2, 1973, Ser. No. 384,978**
**Int. Cl. H04n** *9/00*
**U.S. Cl. 358—3** **6 Claims**

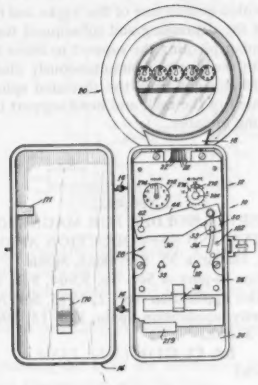



1. A compatible stereoscopic color television system with phase-difference quadrature modulation of the color subcarrier in the frequency spectrum of the luminance signal by chrominance signals of the first image of the stereo pair and transmission of the signals of the second image of the stereo pair on the same subcarrier by its additional modulation by the luminance signals of the second image of the stereo pair so that the amplitude of the subcarrier in one line is equal to the sum of the amplitude of the modulating signal and the square root from the amplitude of the quadrature modulated subcarrier, and in the other line it is equal to the difference of said amplitudes, said additional modulation being effected to preserve the difference of the subcarrier phases in adjacent lines, during reception chrominance signals of said first image of the stereo pair being separated by multiplying the delayed and undelayed voltages of the subcarrier directly for one signal and with an additional 90° phase shift therebetween for the other signal, the chrominance signals of the second image of the stereo pair being separated by detecting the delayed and undelayed voltages and obtaining the difference of their envelopes.

## 3,896,488
## LOAD SURVEY RECORDER INCLUDING TAPE CARTRIDGE RECEPTACLE

**Murray C. Carney, and David G. Hart, both of Springfield, Ill., assignors to Sangamo Electric Company, Springfield, Ill.**

**Filed Apr. 19, 1973, Ser. No. 352,550**
**Int. Cl. G11b** *5/00, 5/54*
**U.S. Cl. 360—6** **26 Claims**



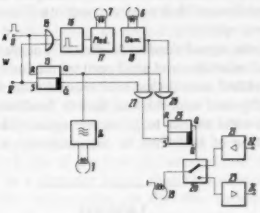
1. A load survey recorder comprising a fixedly immovable front plate, a fixed tape cartridge receptacle located on the outer surface of said front plate for receiving a tape cartridge having at least a first and a second guide hole, said receptacle including a capstan, a pair of reel knobs, and at least first and second fixedly positioned aligning pins for engaging said guide holes in said cartridge to position the same along the X and Y axes relative to the recorder head, all of which are supported by and extend perpendicular to said front plate, an elongated arm member extending in close parallel relation to said outer surface and pivotally mounted at one end on said fixedly immovable front plate for movement between an inoperative position and an operative position, spring means for biasing said arm member in the direction of the operative position, a tape recording head unit mounted on said arm member having a recording head extending downwardly from said arm member, and a pressure roller unit mounted on said arm member at its outer end, said pressure roller unit including a roller, and means for resiliently urging said roller downwardly, where said roller is in resilient engagement with said capstan upon said arm member being located at said lower operative position.

## 3,896,489
## ELECTRONIC TAPE EDITING EQUIPMENT

**Frithjof Rudert, Darmstadt-Eberstadt; Rolf Muller, Seeheim, and Dietmar Gornott, Darmstadt-Arheilgen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany**

**Filed Dec. 19, 1973, Ser. No. 426,360**
**Claims priority, application Germany, Dec. 30, 1972, 2264326**
**Int. Cl. H04n** *5/78;* **G11b** *27/02, 27/32*
**U.S. Cl. 360—14** **12 Claims**

1. In tape recorder equipment having tape, means for transporting said tape along a predetermined path, recording circuits, playback circuits, an erase head mounted in operative proximity to said tape, and at least one record/playback head mounted at a predetermined distance along said predetermined path from said erase head, an electronic editing arrangement for switching said record/playback head from said playback circuits to said recording circuits without creating a gap in the recording on said tape in response to an externally applied record signal, comprising, in combination, additional recording means mounted in operative proximity to said tape for recording a marker signal onto said tape when energized; additional playback means mounted in operative proximity to said tape at a distance from said additional recording means corresponding to said predetermined distance, for sensing said marker signal and furnishing a timing signal in response thereto; means connected to said erase head and said additional recording means for energizing said erase head and said additional recording means substantially simultaneously in

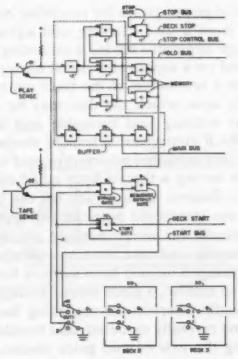


response to said externally applied record signal, thereby creating said marker signal and erasing a portion of the recording on said tape; and switch means connected to said additional playback means, said record/playback head and said recording circuits, for connecting said record/playback head to said recording circuits in response to said timing signal and under control of said externally applied record signal, whereby said record/playback head is connected to said record circuitry when the beginning of said erased portion is in operative proximity to said record/playback head.

## 3,896,490
## AUTOMATED BROADCAST PROGRAMMER

**Andrew M. Rose, 3655 Prune Ridge Ave., Apt. 220, Santa Clara, Calif. 95051, and Geoffrey L. Bryan, 6205 Poe Rd., Bethesda, Md. 20034**

**Continuation-in-part of Ser. No. 294,786, Oct. 4, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,056**
**Int. Cl. G11b** *15/02, 15/18, 27/22*
**U.S. Cl. 360—69** **9 Claims**



1. An automated broadcast programmer comprising:
a. a first machine which is adapted to play recorded information;

b. a second machine which is adapted to play recorded information;
c. a control means;
d. a first signal feedback means coupled between said first machine and said control means for indicating to said control means that said first machine is in a state to become operative;
e. a second signal feedback means coupled between said first machine and said control means for indicating to said control means that said first machine is operative;
f. a third signal feedback means coupled between said second machine and said control means for indicating to said control means that said second machine is in a state to become operative;
g. a fourth signal feedback means coupled between said second machine and said control means for indicating to said control means that said second machine is operative, whereby said second and fourth feedback means cause said control means to generate signals which induces the operation of said first, or alternatively, said second machine.

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**3,896,491**

## SETTING MECHANISM FOR THE PICKUP HEAD OF A DISC STORAGE SYSTEM, ESPECIALLY FOR TEACHING PURPOSES

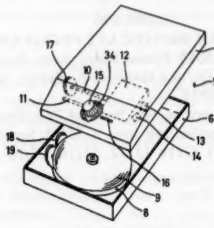
**Gerhard Soehring, Dossenheim; Gerhard Kreutze, Bammental, and Guenther Obstfelder, Leimen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany**

**Filed Oct. 16, 1973, Ser. No. 406,973**

**Claims priority, application Germany, Oct. 21, 1972, 2251786**

**Int. Cl. G11b** *5/54, 21/08, 25/04*

**U.S. Cl. 360—86** **5 Claims**




1. In a disc storage apparatus for recording or reproducing electric signals from a disc carrying said signals in a spiral track, said storage apparatus having a recording or reproducing head mounted on a support for radial movement in selective contact with a revolution of the track on said recording disc, a turntable upon which the disc may be placed and a drive means for rotating said turntable and said disc, the improvement which comprises: a spindle threaded along its length and rotatably mounted adjacent to said turntable, said threaded spindle having a thread pitch equal to the distance between two revolutions at the track on the disc; rotation transmitting means interposed between the drive means and said threaded spindle for simultaneously and synchronously rotating the turntable and said threaded spindle; a threaded guide element arranged on said head support for engagement with said threaded spindle; a guide means arranged parallel to the threaded spindle whereon the recording head support is translationally and pivotally mounted, said translational movement being along the axis of said guide means, said pivotal movement being about the axis of said guide means, said pivotal movement resulting in the disengaging of said threaded guide element and simultaneously moving the head out of contact with the disc; a rack on the recording head support, said rack being arranged parallel to said guide means, said rack having teeth of a given size and pitch; a pinion having teeth of said given size and pitch carried by an actuating member, said pinion being arranged for continuous engagement with said rack, said actuating member being connected to the recording head support and being manually operable in two different modes, in the first of said modes the turning of said actuating member effecting rotational movement of the pinion and lateral movement of the rack and head support, while the said movement is guided via the said threaded guide element which cooperates with the said threaded spindle and thereby ensures a movement of the head for selectively accurate contact with a desired one of the tracks and in the second of said modes the depressing and subsequent turning of said actuating member pivoting the support to move the head out of contact with the disc and simultaneously disengaging the threaded guide element from the threaded spindle for free lateral movement of the rack and head support upon turning of said actuating member.

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**3,896,492**

## TAPE-CASSETTE HOLDER FOR MAGNETOPHONIC RECORDING AND REPRODUCTION APPARATUS

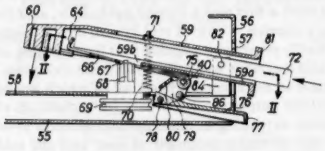
**Arturo Socias, Mallorca 33, Barcelona, Spain**

**Continuation-in-part of Ser. No. 9,904, Feb. 9, 1970, abandoned. This application Apr. 2, 1973, Ser. No. 347,348**

**Claims priority, application Spain, Feb. 15, 1969, 364085; Nov. 8, 1969, 373622**

**Int. Cl. G11b** *15/24, 23/04*

**U.S. Cl. 360—93** **10 Claims**



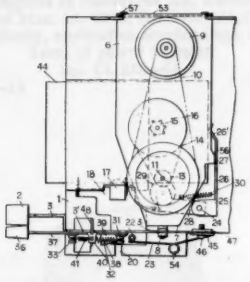

1. A holder for a tape cassette provided with a reel accessible from without, comprising:
a frame having a front wall provided with a window;
an elongate casing with an open front end projecting through said window, said casing being pivotally mounted on said frame for swinging about a horizontal axis adjacent said window, said casing having a rearwardly located cutout giving access to a reel of a cassette inserted into said casing through said front end;
a slider in said cutout provided with a formation projecting into the interior of said casing for rearward entrainment by a rear edge of a cassette inserted through said front end;
link means articulated to said frame and to said slider in operative engagement with said casing rearwardly of said horizontal axis for swinging said casing from a loading position into a working position upon insertion of a cassette;
drive means on said frame aligned with said cutout for engagement with the accessible reel of the inserted cassette upon a swinging of said casing into said working position; and
restoring means mechanically coacting with said link means for returning said casing to said loading position with concurrent forward shift of said slider to eject the inserted cassette.

3,896,493

## RETRACTABLE HEAD FOR TAPE RECORDER

Masatoshi Ando, No. 6-3 Higashigaoka, 2-chome, Tokyo, Japan

Filed Oct. 30, 1973, Ser. No. 411,111
Claims priority, application Japan, Nov. 8, 1972, 47-128768
Int. Cl.[2] G11B 5/54
U.S. Cl. 360—96 8 Claims



1. In a tape cassette phonograph wherein the cassette is provided with a take-up reel,

said phonograph having a tape transducer head, a capstan and a pinch roller,

driving means operative to drive the take-up reel and capstan,

means mounting the head for movement into and out of operative engagement with the tape,

means mounting the pinch roller for movements toward and from the tape to alternately press it into engagement with the capstan and to relieve such pressure,

means normally biasing the head and pinch roller into engagement with the tape,

control means for rendering the driving means inoperative to drive the take-up reel and capstan and for simultaneously retracting the head and pinch roller from the tape,

means forming part of said control means and independently operable relative thereto to solely retract the head and pinch roller from the tape without rendering the drive means inoperative to drive the take-up reel.

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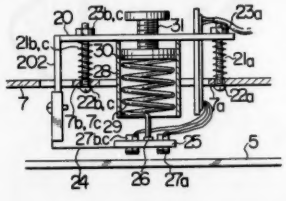
3,896,494

## AIR BEARING HEAD SUPPORT DEVICE FOR MULTI-CHANNEL DISC MEMORY APPARATUS

Teizo Tamura, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 15, 1974, Ser. No. 433,437
Claims priority, application Japan, Jan. 16, 1973, 48-6651
Int. Cl. G11b 5/60, 21/24, 17/02
U.S. Cl. 360—103 7 Claims



1. An air bearing head support device for multi-channel disc memory apparatus comprising:

a rotatable magnetic storage disc;

a fixedly mounted support plate spaced above said disc;

at least three head base-plates, each base-plate having a downwardly bent portion and a hollow head-base cylinder extending toward said disc, respectively, each of said base-plates being connected to said support plate at three positions defined by apexes of a triangle having at least two equal sides by three indepdendently adjustable members, whereby each of said base-plates is adjustable in position and distance with respect to said support plate;

at least three core holders, each of said core holders being connected to a respective base-plate by a leaf-spring, said leaf-spring having one end connected to said core holder and another end connected to the downwardly bent portion of said base-plate, each core holder having three head cores at positions thereon defined by apexes of a triangle having at least two equal sides, a first and a second core holder being arranged in a pair so that at the time of rotation of the disc the rotation trajectories on the disc produced by the head cores on the first core holder and the head cores on the second core holder are alternately positioned, a third core holder being arranged so that mutually adjacent rotation trajectories on the disc produced by a head core of the third core holder and a head core of one of the first and second core holders are separated by a distance larger than that of mutually adjacent rotation trajectories on the disc produced by the head cores of one of the first, second and third core holders; and

a coil spring and an adjusting element accommodated within the hollow head-base cylinder of each base-plate, said coil spring having a downwardly extending lower end connected to the core holder at the point of gravity of the triangle of the head cores and an upper end connected to the adjusting element, the adjusting element being adjustably mounted to the base-plate at the point of gravity of the triangle of the independently adjustable members, whereby each core holder is maintained apart from an coplanar to the disc surface by at least a portion of the leaf-spring, the coil spring and air bearing force produced due to rotation of the disc.

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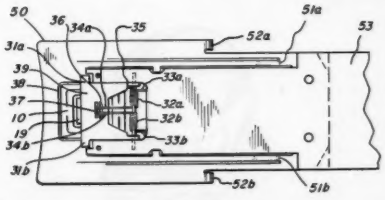
3,896,495

## MECHANICALLY ISOLATED TRANSDUCER HEAD WITH SPRING LOADED ARM FOR FLYING

Harold James Beecroft, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Feb. 25, 1974, Ser. No. 445,410
Int. Cl.[2] G11B 5/60, 17/32, 21/20, 5/54
U.S. Cl. 360—103 5 Claims



1. Apparatus for supporting a magnetic head adjacent a recording surface for transcribing thereon, comprising

a. a rigid cantilevered arm;

b. a thin resilient gimbal sheet having external shape and interior openings defining a first ring attached to the

cantilevered arm at substantially opposite points on the first ring and a second ring spaced apart from the first and attached to it by a pair of webs intersecting the first ring at opposite interior edges between the points at which the first ring is attached to the cantilevered arm, said second ring attached to the magnetic head at a point between the two webs;

c. a pressure arm mounted for rotation on the cantilevered arm in a position permitting its rotation to a position contacting the head on the side opposite that of the transducing surface of the head; and

d. a spring loaded arm rotatably attached to the cantilevered arm and rotatably pressing against the pressure arm to force it toward the head.

# DESIGNS

JULY 22, 1975

**235,937**
**BABY'S ELASTIC PANTS**
**Tor Arne Fröidh, Stenungsund, Hans Erik Waldén, Goteborg, and Leif Urban Roland Widlund, Molnlycke, Sweden, assignors to Molnlycke AB, Goteborg, Sweden**
**Filed Mar. 14, 1974, Ser. No. 451,198**
**Claims priority, application Sweden Sept. 14, 1973**
**Term of patent 14 years**
**Int. Cl. D2—*01***
**U.S. Cl. D2—10**

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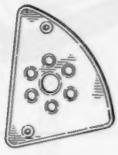
**235,938**
**SAFETY CAP**
**Frank W. Lindblom, Warwick, R.I., assignor to Textron Inc., Providence, R.I.**
**Filed June 27, 1973, Ser. No. 373,975**
**Term of patent 14 years**
**Int. Cl. D2—*03***
**U.S. Cl. D2—231**

**235,939**
**EARPIECE FOR A PROTECTIVE HELMET**
**Robert E. Conroy, Park Ridge, Ill., assignor to Servotronics, Inc., Buffalo, N.Y.**
**Filed June 29, 1973, Ser. No. 374,964**
**Term of patent 14 years**
**Int. Cl. D2—*03***
**U.S. Cl. D2—233**



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**235,940**
**KNIT HELMET**
**Roy E. Stock, 6373 Teller St., Arvada, Colo. 80002**
**Filed Sept. 6, 1974, Ser. No. 503,974**
**Term of patent 14 years**
**Int. Cl. D2—*03***
**U.S. Cl. D2—249**

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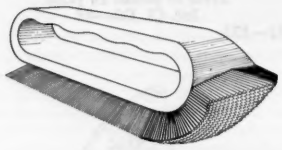
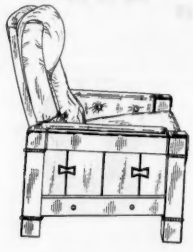
**235,941**
**KNIT HELMET**
**Roy E. Stock, 6373 Teller St., Arvada, Colo. 80002**
**Filed Mar. 4, 1974, Ser. No. 447,490**
**Term of patent 14 years**
**Int. Cl. D2—*03***
**U.S. Cl. D2—249**

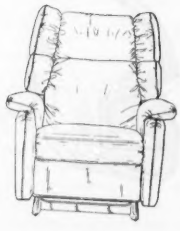
235,942
CORNER CLEANING BRUSH
Leonora Rocke, Las Vegas, Nev., assignor to Sam J. Harris, Edward J. Krausnick, and Mary J. Krausnick, fractional part interest to each
Filed Aug. 15, 1973, Ser. No. 388,564
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—3



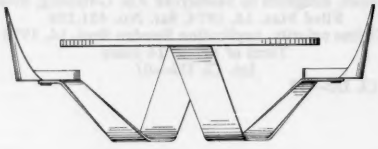
235,943
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Sept. 6, 1974, Ser. No. 503,806
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



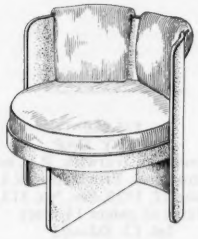
235,944
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Sept. 20, 1974, Ser. No. 507,670
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—37



235,945
COMBINED TABLE AND SEATING UNIT
Alan L. Puskar and Linda S. Puskar, both of 5585 Pacific Coast Highway 362, Long Beach, Calif. 90804
Filed Aug. 29, 1973, Ser. No. 392,629
Term of patent 14 years
Int. Cl. D6—*05*; XD6—*03*
U.S. Cl. D6—45

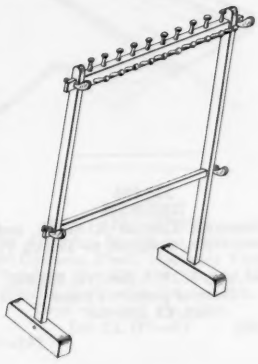


235,946
SEAT
Gordon L. Duern and Donald S. Griffin, Kitchener, Ontario, Canada, assignors to Electrohome Limited, Kitchener, Ontario, Canada
Continuation of abandoned design applications Ser. No. 127,083, Mar. 22, 1971, and Ser. No. 128,646, Mar. 26, 1971. This application Jan. 15, 1973, Ser. No. 323,722
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

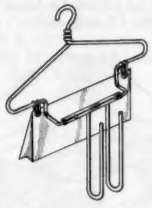


235,947
LOUNGE CHAIR
Tim M. Uyeda, South San Gabriel, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 5, 1973, Ser. No. 338,581
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

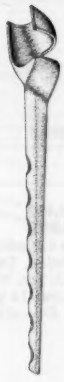
235,948
**CREWEL YARN RACK**
James S. Nerrie, 10 Cherry Tree Lane, Fredericksburg, Va. 22401
Filed Oct. 31, 1973, Ser. No. 411,326
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



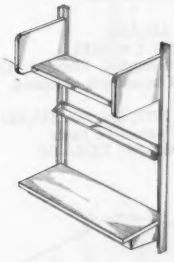
235,949
**SUPPORT FOR TENNIS RACKET AND RELATED ARTICLES**
William J. Garvey, Rte. 1, Indian Trail Road, Barrington, Ill. 60010
Filed Nov. 23, 1973, Ser. No. 418,672
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85



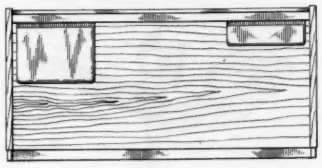
235,950
**GARMENT HANGER SUPPORT FOR A SHOWER HEAD**
Gerhard Kollitz, 1301 E. Commonwealth Ave., Apt. 111, Fullerton, Calif. 92631
Filed Jan. 28, 1974, Ser. No. 437,752
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86



235,951
**CANTILEVERED DESK AND MULTIPLE SHELF COMBINATION**
Juan M. del Castillo, Salamanca 34, 2nd Floor, Mexico City 7, Mexico
Filed Nov. 7, 1973, Ser. No. 413,660
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—128

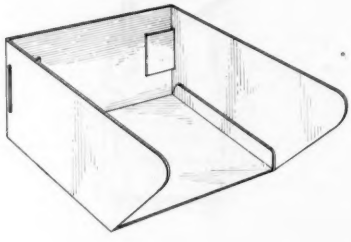


235,952
**DESK OR SIMILAR ARTICLE**
Douglas C. Ball, Senneville, Quebec, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Aug. 30, 1973, Ser. No. 393,244
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

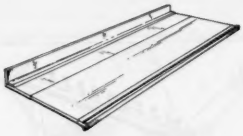


235,953
**TABLE**
Tim M. Uyeda, South San Gabriel, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Mar. 2, 1973, Ser. No. 337,523
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

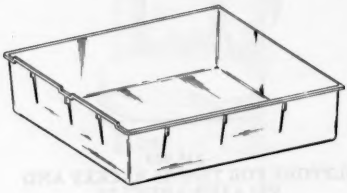
235,954
**STUDY CARREL**
Gustave T. Holland, Burlington, Ontario, Canada, assignor to Learning Consultants Limited, Belleville, Ontario, Canada
Filed Sept. 24, 1973, Ser. No. 399,811
Term of patent 14 years
Int. Cl. D6—*99*; XD6—*04*
U.S. Cl. D6—181



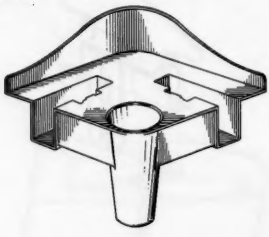
235,955
**COUNTER TOP**
Joseph P. Shelley, Jr., 614 Webster Ave., New Rochelle, N.Y. 10801
Filed Jan. 24, 1972, Ser. No. 220,555
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



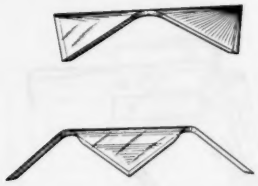
235,956
**DRAWER**
Thomas S. Noneman, Thomas R. Smith, and John B. Stokes, Bryan, Ohio, assignors to Tomco Plastic Inc., Bryan, Ohio
Filed Aug. 2, 1973, Ser. No. 385,046
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



235,957
**BED FRAME CORNER**
Thomas C. Mills, Wheaton, and Stanley T. Gresens, Downers Grove, Ill., assignors to Sealy, Inc., Chicago, Ill.
Filed Mar. 8, 1973, Ser. No. 339,178
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—198



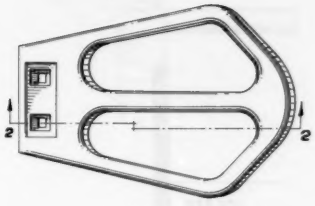
**235,958**
**MIRROR OR SIMILAR ARTICLE**
Edwin A. Day, 607 Quackenbos St. NW., Washington, D.C. 20011
Filed Nov. 1, 1973, Ser. No. 411,713
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235



**235,959**
**PORTABLE STOVE**
Claes Vilhelm Allander, Stockholm, Sweden, assignor to Aktiebolaget Optimus, Flack, Upplands Vasby, Sweden
Filed July 30, 1973, Ser. No. 384,003
Claims priority, application Sweden Feb. 2, 1973
Term of patent 3½ years
Int. Cl. D7—*02*
U.S. Cl. D7—107

**235,960**
**CONDENSING COVER FOR A SAUCE PAN OR THE LIKE**
Robert E. Widdows, 1941 Larkspur Drive, Fort Collins, Colo. 80521
Filed Feb. 1, 1973, Ser. No. 328,838
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—131

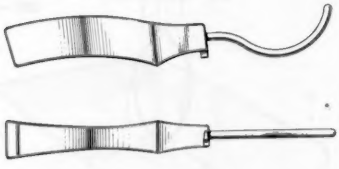
**235,961**
**GRILL HANDLE**
Mario Victor Bondanini, 5–7 Rue Neuve, 1020 Renes, Switzerland
Filed Dec. 29, 1972, Ser. No. 319,631
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—132




**235,962**
**SPOON OR SIMILAR ARTICLE**
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed May 8, 1974, Ser. No. 467,864
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

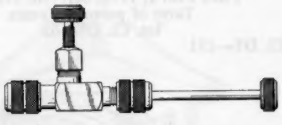
235,963
**SPOON OR SIMILAR ARTICLE**
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed May 3, 1974, Ser. No. 466,552
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

235,964
**ORANGE PEELER**
Antonio R. Lovato and Victoria C. Lovato, Los Angeles, Calif., assignors to Idex Corporation, Sherman Oaks, Calif.
Filed May 6, 1974, Ser. No. 467,302
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—147

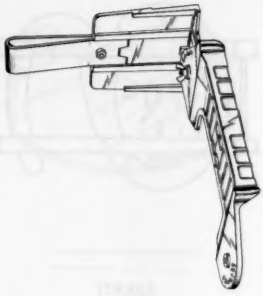


235,965
**ICE AND SNOW SCRAPER**
Paul H. Grinnell, 9437 Dorothy Ave., Garfield Heights, Ohio 44125, and Carl D. Vajdich, 18801 Waterbury Ave., Maple Heights, Ohio 44137
Filed Sept. 9, 1974, Ser. No. 504,298
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—184

235,966
**VALVE CORE REMOVAL TOOL**
John W. Olson, Jr., Garland, Tex., assignor to C & D Valve Manufacturing Co., Oklahoma City, Okla.
Filed Apr. 18, 1974, Ser. No. 461,973
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

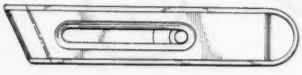


235,967
**SAW GUIDE**
William John Hildebrandt, West Simsbury, and Laird Fortune Convey, Easton, Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Sept. 12, 1973, Ser. No. 396,394
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D7—71

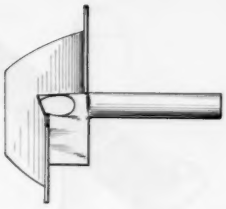


235,968
**NAIL DRIVING DEVICE**
Edward G. Mein, 6672 Sims Drive, Oakland, Calif. 94611
Filed Jan. 28, 1974, Ser. No. 436,932
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—75

235,969
**POCKET KNIFE WITH RETRACTABLE BLADE**
William Albert Reaney and Michael Taylor, Woodside, Sheffield, England, assignors to Stanley Tools Limited, Woodside, Sheffield, England
Filed Dec. 21, 1972, Ser. No. 317,395
Claims priority, application Great Britain July 4, 1972
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



235,970
**LATCH FOR ROLLING METAL GATES**
Vincent Greco, 195 Huntington Ave., Bronx, N.Y. 10465
Filed Aug. 22, 1973, Ser. No. 390,572
Term of patent 7 years
Int. Cl. D8—*07*
U.S. Cl. D8—127

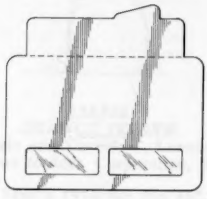


235,971
**BOTTLE**
Joseph E. Visola, 924 Kevin Court, Modesto, Calif. 95350
Filed Feb. 28, 1974, Ser. No. 446,853
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48

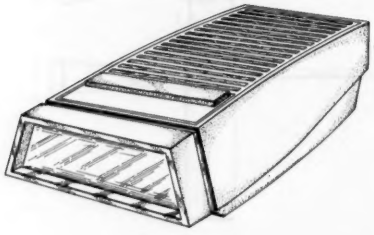
235,972
**BOTTLE**
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Sept. 27, 1973, Ser. No. 401,351
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—129

235,973
**PLASTIC PREFORM CONTAINER OR THE LIKE**
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 24, 1973, Ser. No. 363,465
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D9—171

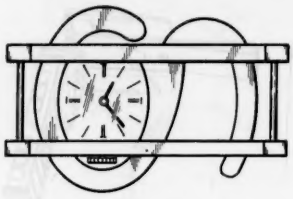
235,974
**BACKING BOARD FOR A BACON PACKAGE**
Oscar E. Seiferth, Madison, and Glenn M. Austin, Oxford, Wis., and Donald L. Paul, Tokyo, Japan, assignors to Oscar Mayer & Co. Inc.
Filed Feb. 12, 1973, Ser. No. 331,631
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294



235,975
**DIGITAL CLOCK**
Eugene J. Sulek, Richardson, Tex., assignor to Texas Instruments Incorporated
Filed Dec. 12, 1973, Ser. No. 424,143
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



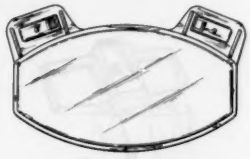
235,976
**WRISTWATCH**
Paul M. Larvego, 11 Rue de Berne, Geneva, Switzerland
Filed July 24, 1973, Ser. No. 382,114
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



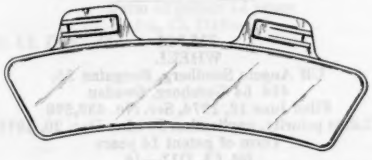
235,977
**REFLECTOR**
Gerald Golden, Highland Park, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Apr. 16, 1974, Ser. No. 461,374
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

235,978
**REFLECTOR**
Gerald Golden, Highland Park, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Aug. 7, 1974, Ser. No. 495,393
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

**235,979**
**REFLECTOR**
Gerald Golden, Highland Park, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Aug. 7, 1974, Ser. No. 495,392
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

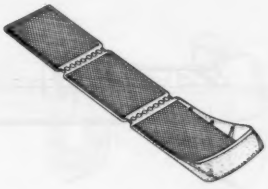


**235,980**
**REFLECTOR**
Gerald Golden, Highland Park, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Aug. 7, 1974, Ser. No. 495,400
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

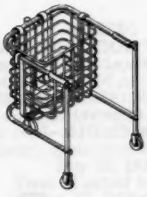


**235,981**
**REFLECTOR**
Gerald Golden, Highland Park, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Apr. 16, 1974, Ser. No. 461,375
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

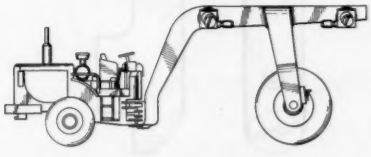
**235,982**
**TOBOGGAN**
McKinley W. Thompson, Jr., Detroit, Mich., assignor to Meadowbrook Manufacturing Corporation, Dearborn, Mich.
Filed Dec. 3, 1973, Ser. No. 420,786
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—11



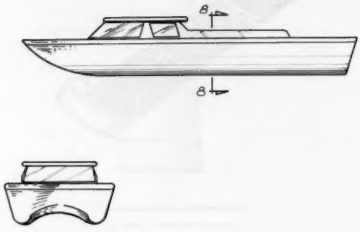
**235,983**
**COMBINED WALKER AND SHOPPING CART**
Albina M. Dornik, 12555 Bellaire Road, Cleveland, Ohio 44135
Filed Feb. 21, 1974, Ser. No. 444,528
Term of patent 14 years
Int. Cl. D12—*02, 12*
U.S. Cl. D12—26



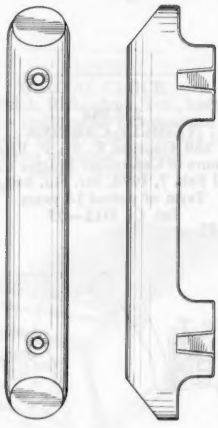
**235,984**
**VEHICLE CARRIER**
Dino Crovatto and Georges F. M. P. Etienne, Brussels, Belgium, assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 7, 1974, Ser. No. 440,463
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—57



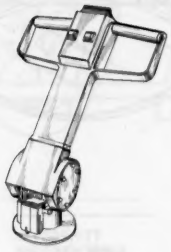
235,985
**TWIN KEEL BOAT**
Antone Arruda, 12209 S. Eucalyptus Ave., Hawthorne, Calif. 90250
Filed Oct. 12, 1972, Ser. No. 296,771
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



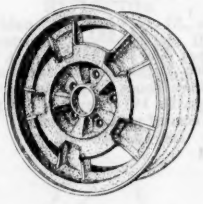
235,986
**BOAT DOCK BUMPER**
George I. Nielsen, 469 Minnesota Ave., Roseville, Minn. 55113
Filed May 28, 1974, Ser. No. 473,433
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—168



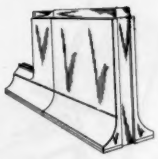
235,987
**CONTROL HANDLE FOR AN INDUSTRIAL TRUCK**
Rune G. Mono, Taby, Sweden, assignor to AB Bygg-och Transportekonomi (BT), Bromma, Sweden
Filed Dec. 26, 1972, Ser. No. 318,488
Claims priority, application Sweden July 5, 1972
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—174



235,988
**WHEEL**
Ulf Angelo Sandberg, Bangatan 35, 414 64 Goteborg, Sweden
Filed June 18, 1974, Ser. No. 480,590
Claims priority, application Sweden Dec. 20, 1973
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



**235,989**
**PASSENGER CONVEYOR BALUSTRADE OR SIMILAR ARTICLE**
**Deane W. Richardson, Worthington, Ohio, assignor to Westmont Industries, Santa Fe Springs, Calif.**
**Filed June 25, 1973, Ser. No. 373,107**
**Term of patent 14 years**
**Int. Cl. D25—*02***
**U.S. Cl. D13—7 R**



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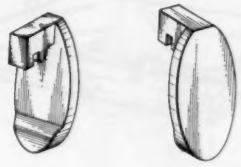
**235,990**
**BALL POINT PEN**
**Clarence D. Zierhut, Granada Hills, Calif., assignor to The Gillette Company, Boston, Mass.**
**Filed Jan. 18, 1974, Ser. No. 434,412**
**Term of patent 14 years**
**Int. Cl. D19—*06***
**U.S. Cl. D19—45**

**235,991**
**POCKET CLIP FOR WRITING INSTRUMENT**
**Toshihiro Nakata, Tokyo, Japan, assignor to Platinum Fountain-Pen Co., Ltd., Tokyo, Japan**
**Original design application Dec. 3, 1971, Ser. No. 204,790, now Patent No. 232,197. Divided and this application Nov. 23, 1973, Ser. No. 418,651**
**Claims priority, application Japan June 5, 1971, July 22, 1971**
**Term of patent 14 years**
**Int. Cl. D19—*99***
**U.S. Cl. D19—56**



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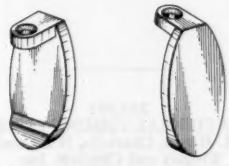
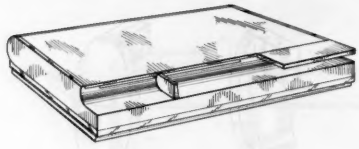
**235,992**
**POCKET CLIP FOR WRITING INSTRUMENT**
**Toshihiro Nakata, Tokyo, Japan, assignor to Platinum Fountain-Pen Co., Ltd., Tokyo, Japan**
**Original design application Dec. 3, 1971, Ser. No. 204,790, now Patent No. 232,197. Divided and this application Nov. 23, 1973, Ser. No. 418,652**
**Claims priority, application Japan June 5, 1971, July 22, 1971**
**Term of patent 14 years**
**Int. Cl. D19—*99***
**U.S. Cl. D19—56**



235,993
**TELEPHONE INDEX**
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 22, 1974, Ser. No. 472,272
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



235,994
**STATIONERY TRAY**
Frank Joseph Stiene, Ridgewood, N.J., assignor to Mercedes-Benz of North America, Inc., Montvale, N.J.
Filed Aug. 21, 1972, Ser. No. 282,578
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92

235,995
**ARTIFICIAL FISHING LURE**
Robert K. Harris, Charlotte, N.C., assignor to Ringley and Crockett, Inc.
Filed Sept. 24, 1973, Ser. No. 399,708
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

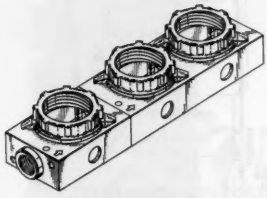
235,996
**PORTABLE SPRAYING UNIT**
Barry L. Schneider, Crystal Lake, Ill., assignor to Chemtrust Industries Corporation, Franklin Park, Ill.
Filed Mar. 27, 1974, Ser. No. 455,300
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

235,997
**SHOWER HEAD**
Allan B. Johnson, Tarzana, Calif., assignor to Teledyne Industries, Inc., doing business as Teledyne Aqua Tec Co., Fort Collins, Colo.
Filed Feb. 12, 1973, Ser. No. 331,830
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—35

**235,998**
**COUPLING UNIT FOR FLUID CONTROL COMPONENTS**

Leslie William Smith, 4 Springfield Close, Shipston-on-Stour, Warwickshire, England; Michael John Wates, 27 Moat Farm Lane, Bishampton, near Pershore, Worcestershire, England; and Robert John Tait, Mount Cottage, Campden Road, Shipston-on-Stour, Warwickshire, England

Filed Jan. 17, 1973, Ser. No. 324,309
Claims priority, application Great Britain July 18, 1972
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



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**235,999**
**NOZZLE**

Hosey M. Harrell and Clifford H. Ownby, both of P.O. Box 6811, Houston, Tex. 77005

Filed Apr. 30, 1973, Ser. No. 355,801
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

**236,000**
**BATHTUB**

David Harman Powell, Maldon, England, assignor to Pye Limited

Filed Jan. 28, 1974, Ser. No. 437,512
Claims priority, application Great Britain July 26, 1973
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

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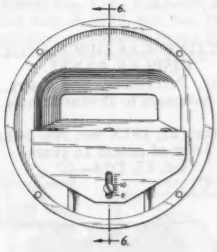
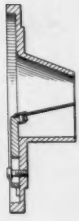
**236,001**
**FLOW REGULATOR**

Stellan S. Akesson and Karel E. Pruner, Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

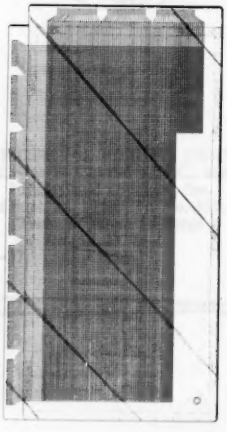
Continuation-in-part of abandoned design application Ser. No. 283,636, Aug. 25, 1972. This application Oct. 29, 1974, Ser. No. 518,224
Claims priority, application Sweden Aug. 17, 1972
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



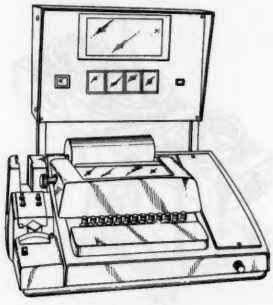


236,002
**EMISSION ELECTRODE FOR AN ELECTROSTATIC PRECIPITATOR**
Kjell Porle and Sten Maartmann, Vaxjo, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Oct. 17, 1973, Ser. No. 407,312
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 L

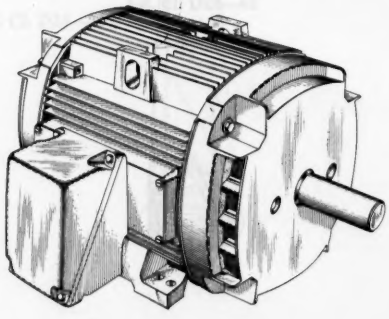
236,003
**LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL**
William D. Petty, Perrysburg, and Larry J. Lohmann, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 21, 1973, Ser. No. 343,589
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



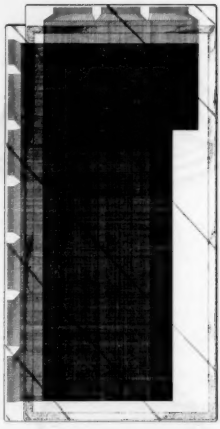
236,004
**TAPE PREPARATION SYSTEM**
Patrick V. Keene, San Diego, Calif., assignor to Do All Company, Des Plaines, Ill.
Filed Jan. 25, 1974, Ser. No. 436,626
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



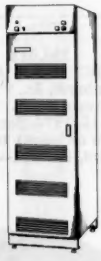
236,005
**DYNAMOELECTRIC MACHINE**
Frederick W. Baumann, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Oct. 24, 1972, Ser. No. 300,019
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A



**236,006**
**LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL**
William D. Petty, 524 Clover Lane, Perrysburg, Ohio 43551, and Larry J. Lohmann, 2416 Oak Grove Place, Toledo, Ohio 43613
Filed Aug. 6, 1973, Ser. No. 386,126
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

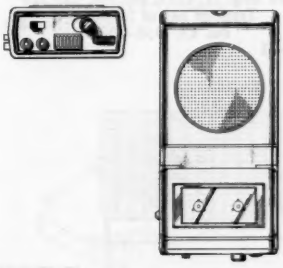


**236,007**
**REMOTE DATA ACQUISITION AND CONTROL STATION**
Myron F. Davis, Jr., and Joseph F. Talerico, Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Dec. 6, 1973, Ser. No. 422,446
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

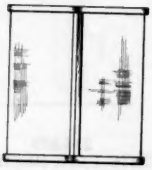


**236,008**
**AUTOMATIC TELEPHONE DIALER**
Thomas G. Wixon, 1589 Blackstock Ave., Simi, Calif. 93065
Filed Aug. 8, 1973, Ser. No. 386,726
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

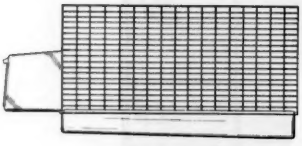
**236,009**
**MAGNETIC TAPE RECORDER OR SIMILAR ARTICLE**
Yasuo Hattori, Tokyo-to, Japan, assignor to Olympus Optical Co., Ltd., Tokyo-to, Japan
Filed Aug. 3, 1973, Ser. No. 385,338
Claims priority, application Japan Feb. 10, 1973
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

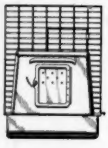


**236,010**
**LOUDSPEAKER CABINET**
James C. Carroll, P.O. Box 5301, Knoxville, Tenn. 37918
Filed Dec. 20, 1972, Ser. No. 316,823
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

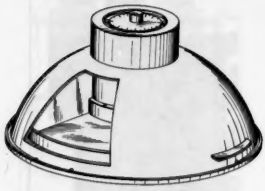


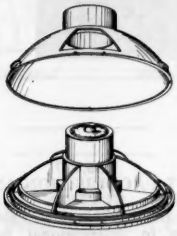
**236,011**
**CAGE FOR DOMESTIC ANIMALS OR SIMILAR ARTICLE**
Dwain F. Roche, New Strawn, Kans., assignor to Herbert R. Amann, Greenwood, Mo.
Filed Aug. 31, 1972, Ser. No. 285,324
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1





**236,012**
**ANIMAL FEEDER OR THE LIKE**
Beverley Crawford, 315 E. 65th St. 10021, and Genelle Jenkins, 107 E. 60th St. 10022, both of New York, N.Y.
Filed July 5, 1973, Ser. No. 376,895
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13





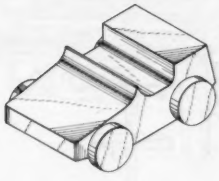
**236,013**
**RESILIENT TOY ARTICLE**
Salvatore Lombardi, Jr., 7 Fairview Circle, Barrington, R.I. 02806
Filed Apr. 15, 1974, Ser. No. 461,166
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP

236,014
**TOE FIXTURE FOR A SKI SAFETY BINDING**
Michio Iizuka, Tokyo-to, Japan, assignor to Hope Kabushiki Kaisha
Filed Nov. 6, 1973, Ser. No. 413,393
Claims priority, application Japan May 6, 1973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

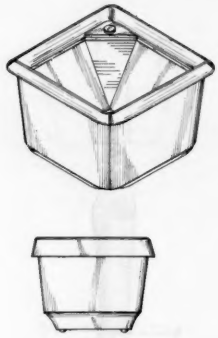
236,015
**HEEL UNIT OF A SKI SAFETY BINDING**
Masahiro Murata, Tokyo-to, Japan, assignor to Hope Kabushiki Kaisha
Filed Nov. 5, 1973, Ser. No. 412,984
Claims priority, application Japan May 6, 1973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

236,016
**STILT**
Peter F. Boyce, 118 E. Rio Grande Ave., Wildwood, N.J. 08260
Original design application Apr. 25, 1972, Ser. No. 247,506, now abandoned. Divided and this application Oct. 3, 1972, Ser. No. 294,542
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D34—14 E

236,017
**TOY CAR**
Erkki Pekka Korpijaako, Princeton, N.J., and Jorma Vennola, Corning, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,210
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



**236,018**
**SELF-WATERING PLANTER**
June H. Swift, P.O. Box 28012, and John A. Swift, 2740 Mayhew, both of Dallas, Tex. 75228
Filed May 21, 1973, Ser. No. 362,536
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



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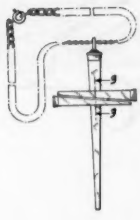
**236,019**
**CROSS PENDANT OR THE LIKE**
Robert K. Scott, Jacksonville, Fla., assignor to Abba House, Inc., Jacksonville, Fla.
Original design application Nov. 8, 1972, Ser. No. 304,662, now Patent No. 233,362. Divided and this application Aug. 2, 1974, Ser. No. 494,323
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 B



**236,020**
**STAMPED BEARING ASSEMBLY**
Vincent C. Wachter, Milford, Joseph R. Keller, Fairfield, and Frederick J. Feldmann, Stratford, Conn., assignors to MPB Corporation, Keene, N.H.
Original design application Aug. 27, 1971, Ser. No. 175,800, now Patent No. 203,030. Divided and this application July 27, 1973, Ser. No. 383,404
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1 R

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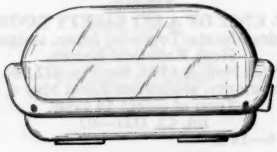
**236,021**
**LIGHTING FIXTURE**
Sergio Gandini, Via Tosio 20, Brescia, Italy
Filed June 1, 1973, Ser. No. 366,204
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



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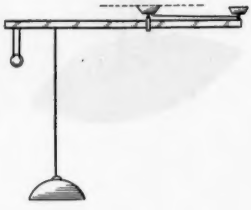
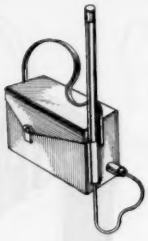
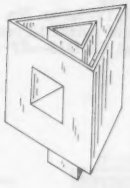
**236,022**
**CEILING LAMP**
Lodovico Magistretti, Via Conservatorio 20, Milan, Italy
Filed Mar. 13, 1973, Ser. No. 340,785
Claims priority, application Italy Sept. 19, 1972
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



**236,023**
**COMBINED PORTABLE FLUORESCENT LIGHT AND POWER PACK THEREFOR**
Thomas N. Zelina, Erie, Pa., assignor to Lighting Systems, Inc.
Filed May 22, 1974, Ser. No. 472,134
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

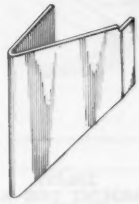


**236,024**
**COMBINED MOLD AND PERMANENT OUTSIDE SHELL FOR EXTERIOR LIGHTING FIXTURE**
Howard W. Stentz, 6956 Delmeta Lane, Dallas, Tex. 75240
Filed July 19, 1973, Ser. No. 380,890
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31



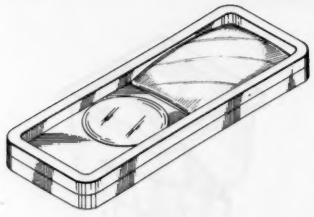
**236,025**
**GASOLINE PUMP INDICATOR HOUSING**
Aquilles Alberto Correa De Sa E Benevides, Rio de Janeiro, Brazil, assignor to Texaco Brasil S.A.
Filed Sept. 28, 1973, Ser. No. 401,743
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A

**236,026**
**CORNER BRACE FOR A METAL FORM UNIT**
Lyde S. McCracken, Des Moines, Iowa, assignor to Economy Forms Corporation
Filed May 30, 1974, Ser. No. 474,695
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D54—1 R



**236,027**
**COMBINED PIANO AND JUKE BOX**
James L. Terrell, 704 Clinton St., Waukegan, Ill. 60085
Filed Mar. 20, 1972, Ser. No. 236,550
Term of patent 14 years
Int. Cl. D17—*01*; D14—*01*
U.S. Cl. D56—9

**236,028**
**MAGNIFIER**
Philip J. Schroeder, Wellesley, Mass., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 26, 1973, Ser. No. 326,906
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



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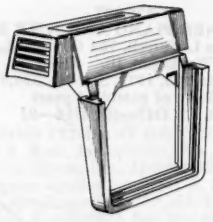
**236,029**
**ACCESSORY MOUNT FOR A CAMERA OR SIMILAR ARTICLE**
Edwin H. Land, Cambridge, and John B. Morse, Boston, Mass., assignors to Polaroid Corporation
Filed Aug. 10, 1973, Ser. No. 387,233
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E



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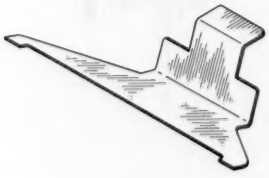
**236,030**
**PAPER TRAY**
Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 29, 1972, Ser. No. 319,834
Term of patent 14 years
Int. Cl. D16—*99*; D18—*99*
U.S. Cl. D61—1 Q



**236,031**
**PHOTOGRAPHIC LENS SHADE OR SIMILAR ARTICLE**
Karl H. Aimo, Cambridge, and Philip G. Baker, Peabody, Mass., assignors to Polaroid Corporation
Filed June 1, 1973, Ser. No. 365,830
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E

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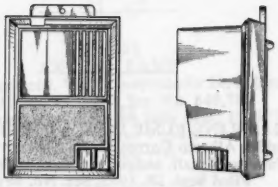
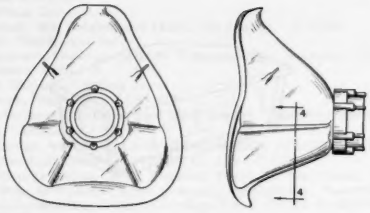
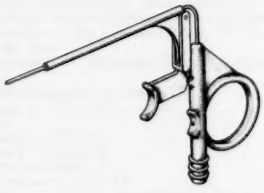
**236,032**
**AQUARIUM AIR PUMP**
Marvin A. Goldman, Great Neck, and Jerome N. Goldman, New York, N.Y., assignors to Penn-Plax Plastics, Inc., Garden City, N.Y.
Filed Jan. 9, 1974, Ser. No. 431,899
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 R



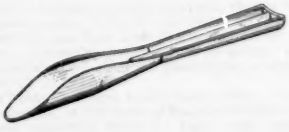
**236,033**
**RESPIRATORY MASK**
Gale E. Dryden, 5835 N. Tacoma Ave., Indianapolis, Ind. 46220
Filed Dec. 14, 1972, Ser. No. 315,206
Term of patent 14 years
Int. Cl. D29—*02*; D24—*02*
U.S. Cl. D83—1 K



**236,034**
**MYRINGATOME-ASPIRATOR-TUBE INSERTER**
James L. Geraci, Cincinnati, Ohio, assignor to Xomox Corporation
Filed Sept. 18, 1973, Ser. No. 398,510
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R



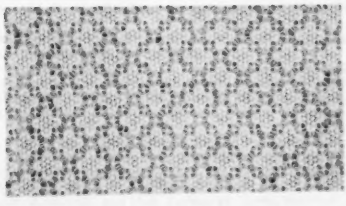
**236,035**
**TAMPON INSERTER**
Evelyn Ciencewicki, South River, N.J., assignor to Personal Products Company, Milltown, N.J.
Filed Sept. 10, 1973, Ser. No. 395,474
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 A



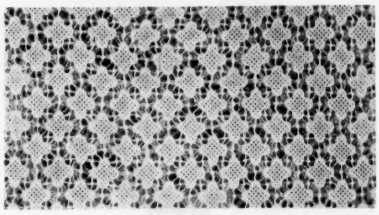
**236,036**
**HANDBAG**
Clarence V. Tibbs, Knoxville, Tenn., assignor to Balls 'n' All, Inc., Knoxville, Tenn.
Filed Aug. 24, 1973, Ser. No. 391,301
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

**236,037**
**WRIST PURSE OR SIMILAR ARTICLE**
Joseph J. McCarthy, Saugus, Mass. (21 Berwick, Melrose, Mass. 02176)
Filed May 30, 1973, Ser. No. 365,081
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 B

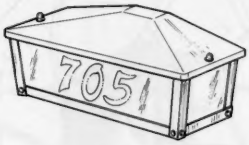
**236,038**
**NONWOVEN LACE FABRIC**
Dale E. Mancuso, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 9, 1973, Ser. No. 406,648
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1 PP



**236,039**
**NONWOVEN LACE FABRIC**
Dale E. Mancuso, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 9, 1973, Ser. No. 406,649
Term of patent 14 years
Int. Cl. D5—*02*
U.S. Cl. D92—1 PP



**236,040**
**ILLUMINATED SIGN**
Heinz G. Schuette, 26145 Shook Road, Mount Clemens, Mich. 48043
Filed June 4, 1973, Ser. No. 366,328
Term of patent 14 years
Int. Cl. D20—*03*; D26—*05*
U.S. Cl. D96—12 R



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 22ND DAY OF JULY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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de Jongh, Hendrik A. P.; and de Jonge, Cornelis R. H. I., 3,896,099.

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Alcorn, Charles Noble; De Filippi, Robert Joseph; Henke, John David; and Liang, Robert Ng, to International Business Machines Corporation. Integrated monolithic switch for high voltage applications. 3,896,317, Cl. 307-254.000.

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Andersson, Olle; and Ericsson, Ellerth, 3,896,406.

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ALZA Corporation: *See—*
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Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., 3,896,129.
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Ammann, Paul R., to Kennecott Copper Corporation. Method for recovering molybdenum from particulate silicate slags. 3,896,210, Cl. 423-56.000.

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AMP Incorporated: *See—*
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Anderson, D. Richard; Courtney, Robert L.; and Harrah, Larry A., to United States of America, Energy Research and Development Administration. Low temperature, low pressure hydrogen gettering. 3,896,042, Cl. 252-184.000.

Anderson, Douglas W.: *See—*
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Anderson, Ernest David, to Leesona Corporation. Cylinder motion sensing. 3,895,560, Cl. 91-1.000.

Andersson, Olle; and Ericsson, Ellerth, to Allmanna Svenska Elektrika Aktiebolaget. Screen for core legs for transformers, reactors and the like. 3,896,406, Cl. 336-84.000.

Ando, Masatoshi. Retractable head for tape recorder. 3,896,493, Cl. 360-96.000.

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Anikanov, Nikolia Ivanovich; Grachev, Leonid Pavlovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich. Conveyor for transporting plies of newspapers. 3,895,707, Cl. 198-179.000.

Anthony B. Askew: *See—*
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Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Semiconductor device production. 3,895,967, Cl. 148-1.500.

Antonini, Giancarlo: *See—*
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Aquarius, Inc.: *See*—
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Beal, Philip F., III; Lincoln, Frank H., Jr.; and Pike, John E., to Upjohn Company, The. Dihydroprostaglandin E, analogs. 3,896,156, Cl. 260-468.00D.
Bear, Fred B., to Victor Comptometer Corporation. Imitation feather fletching and method of making same. 3,895,802, Cl. 273-106.50C.
Beatrice Foods Company: *See—*
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Beaver, Guy Daniel; Young, Robert Cleland; and Martin, Donald Theodore, to Babcock & Wilcox Company, The. Method for forming and curing a fiber reinforced hollow epoxy shaft. 3,896,206, Cl. 264-258.000.
Bechstein, Herbert; Jaenke, Hans-Jurgen; Muller, Rolf; Ritter, Ernst; Staudt, Heinrich; Tomasch, Helmut; and Urlberger, Alois, to Robert Bosch G.m.b.H. Centrifugal rpm regulator for internal combustion engines. 3,895,537, Cl. 73-550.000.
Beck, Henry Nelson, to Dow Chemical Company, The. Nucleation of isotactic polystyrene. 3,896,100, Cl. 260-93.50A.
Becker, Klaus H.; Haywood, Fred F.; Perdue, Philip T.; and Thorngate, John H., to United States of America, Energy Research and Development Administration. Fast-neutron solid-state dosimeter. 3,896,306, Cl. 250-392.000.
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Bedford, John, to Ferranti Limited. Apparatus for the measurement of short time intervals. 3,896,378, Cl. 324-188.000.
Beecham, David, to Bell Telephone Laboratories, Incorporated. Buffer store using shift registers and ultrasonic delay lines. 3,896,417, Cl. 340-172.500.
Beecroft, Harold James, to Control Data Corporation. Mechanically isolated transducer head with spring loaded arm for flying. 3,896,495, Cl. 360-103.000.
Behm, Carl M. Apparatus for and method of testing for predetermined unbalance of electric motor rotors and the like. 3,895,536, Cl. 73-462.000.
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Resta, Vincent A., 3,896,301.
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Berger, Leo; and Corraz, Alfred John, to Hoffmann-La Roche Inc. Carbazoles. 3,896,145, Cl. 260-315.000.
Berger, Leonard; and Underhill, Robert A., to Rapid-American Corporation. Tampon inserter. 3,895,634, Cl. 128-263.000.
Bergfjord, John Alf; Radler, Richard William; and Millonzi, Richard Phillip, to Xerox Corporation. Polymers of benzanthracene as active matrix materials. 3,896,184, Cl. 260-669.0QZ.
Berkner, Rolf, to Semikron Gesellschaft fur Gleichrichterbau u. Elektronik m.b.H. Coating semiconductor surfaces. 3,896,254, Cl. 428-411.000.
Berkowitz, Gerard J. Cabinet door alarm device. 3,895,599, Cl. 116-95.000.
Berkoz, Belig M.; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. Process for preparing 3-(4-or-5-azidocarbonylthiazol-2-oxy)-propanediol-1,2-acetonides. 3,896,139, Cl. 260-302.00R.
Berman, Herbert A.; Campbell, Robert B.; and Loftus, Wallace D., to Westinghouse Electric Corporation. Photodetector apparatus with a zero cut-off response to absolute zero at a specified light frequency. 3,896,313, Cl. 250-372.000.
Bernauer, Karl; Borgulya, Janos; and Schneider, Fernand, to Hoffmann-La Roche Inc. Process for preparing 1,2,3,8,9,9a-hexahydro-5,6-dialkoxy-1-alkyl-benzo[d,e]quinolin-7-ore compounds. 3,896,132, Cl. 260-289.00R.
Bernstein, Joseph D. Mounting strip for flexible sheet material. 3,895,468, Cl. 52-222.000.
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Beutel, Peter; Adolphi, Heinrich; and Kiehs, Karl, to BASF Aktiengesellschaft. Sulfurous phosphoric and phosphonic esters. 3,896,190, Cl. 260-945.000.
BF Goodrich Company, The: *See—*
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Bieber, Clarence George, to International Nickel Company, Inc., The. Corrosion resistant high chromium ferritic stainless steel. 3,895,940, Cl. 75-128.00W.
Biermann, Klaus; Burbach, Jurgen; Gimpel, Horst; and Zirpins, Burckhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for generating high pressures and temperatures. 3,895,894, Cl. 425-77.000.
Bigenwald, John J., to Xerox Corporation. Vacuum sheet stripper. 3,895,793, Cl. 271-174.000.
Bilek, Jan, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Device for controlling gripper shuttle in looms. 3,895,657, Cl. 139-125.000.
Bilotti, Alberto; and Lutz, Ronald W., to Sprague Electric Company. A.C. coupling network. 3,896,383, Cl. 325-347.000.
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Bitantis, Edward. Gripping device for accomodating either male or female components. 3,895,828, Cl. 280-493.000.
Blake, Douglas O., to United States of America, Army. Valve position indicator. 3,896,280, Cl. 200-81.90M.
Blakeslee, Dirk C.; and Farrell, Thomas C., to Rockwell International Corporation. Pressure and temperature compensated indicating apparatus for fluid meters. 3,895,532, Cl. 73-233.000.
Blanton, Albert G.: *See—*
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Blaschke, Felix, to Siemens Aktiengesellschaft. Control arrangement for a self-controlled synchronous machine. 3,896,351, Cl. 318-175.000.
Blickle, Karl, to J. M. Voith GmbH. Ship propulsion unit having a variable pitch propeller. 3,895,598, Cl. 115-35.000.
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Bobenrieth, Albert, to Thomson-CSF. Apparatus for effecting deposition by ion bombardment. 3,895,602, Cl. 118-49.100.
Bockau, Gustav; Gormann, Willi; Fernholz, Werner; and Frenyo, Pal, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Scraper chain conveyor. 3,895,705, Cl. 198-109.000.
Bockowski, Edmund J.; and Stefanelli, Louis J., to Betz Laboratories, Inc. Photometric test method for chelant residual or deficiency. 3,895,913, Cl. 23-230.00R.
Boehringer Ingelheim GmbH: *See—*
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Bogert, Clayton. Protective and safety closure for containers. 3,896,335, Cl. 215-219.000.

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Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, to Rhone-Poulenc, S.A. Iminoxyorganosilanes. 3,896,079, Cl. 260-46.50G.

Bokenkamp, Donald G., to Dolphin International, Inc. Riser pipe stacking method. 3,895,677, Cl. 166-.500.

Bolling, Gustaf Frederic; and Cisse, Jean, to Ford Motor Company. Aluminum silicon alloys. 3,895,941, Cl. 75-148.000.

Bolshakov, Alexandr Ivanovich; Mikhailov, Alfa Ivanovich; Barkalov, Igor Mstislavovich; and Goldansky, Vitaly Iosifovich. Copolymers of acetone with unsaturated compounds of aliphatic series and a method for preparing same. 3,896,084, Cl. 260-63.00R.

Bolton, James Alfred; and Peiffer, Howard Richard, to AMP Incorporated. Brittle-surfaced connector. 3,895,851, Cl. 339-95.00R.

Bone, Arnold R., to Dennison Manufacturing Company. Fastener attachment system needle constructions. 3,895,753, Cl. 227-67.000.

Bonis, Maurice, to U.S. Philips Corporation. Semiconductor device comprising resistance region having portions lateral to conductors. 3,896,475, Cl. 357-35.000.

Borden, George Wayne; and Trecker, David John, to Union Carbide Corporation. Novel esters of alkyloxy and alkaryloxypolyethylene glycols. 3,896,161, Cl. 260-486.00R.

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Borgulya, Janos: *See—*
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Bouchard, Robert Joseph; and Rogers, Donald Burl, to du Pont de Nemours, E. I., and Company. Pyrochlore-related oxides containing copper and/or silver and resistor compositions thereof. 3,896,055, Cl. 252-521.000.

Bouchy, Jean C.; and Hardman, T. J., to McNay Equipment Company, Inc. Electronic control system for fluid measurement of a closed air space. 3,895,519, Cl. 73-149.000.

Bournham, Gerald E., Sr., to Well Control, Inc. Apparatus for the degassification of drilling muds. 3,895,927, Cl. 55-170.000.

Bouyoucos, John V., to Hyroacoustics Inc. Acoustic transmitter. 3,895,688, Cl. 181-402.000.

Bowthorpe Hellermann Limited: *See—*
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Brandstatter, Miroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Quickly replaced pattern drum. 3,895,504, Cl. 66-156.000.

Bratzler, Karl; Doerges, Alexander; and Schlauer, Johann, to Metallgesellschaft Aktiengesellschaft. Process for the removal of hydrogen sulfide from a gas stream. 3,896,215, Cl. 423-573.000.

Braun, Anton: *See—*
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Bray Oil Company: *See—*
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Brechling, George E.; and Montren, John J., to International Business Machines Corporation. Dynamic MOSFET layout technique. 3,896,482, Cl. 357-23.000.

Brenin, Alexandr Ivanovich: *See—*
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Brennan, Thomas M.: *See—*
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Brewing Patents Limited: *See—*
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British Aircraft Corporation Limited: *See—*
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Broecker, Franz Josef; Heners, Juergen; Marosi, Laszlo; Schwarzmann, Matthias; and Laurer, Peter Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Nickel-containing hydrogenation catalysts for the selective hydrogenation of fats and oils. 3,896,053, Cl. 252-466.00J.

Broker, David C.; and Wisniewski, Judith L., to Johnson Service Company. Method for making tubular fluidic resistors. 3,896,205, Cl. 264-251.000.

Brooks, John A.; and Krenzer, Robert W., to United States of America, Energy Research and Development Administration. Weldable, age hardenable, austenitic stainless steel. 3,895,939, Cl. 75-124.000.

Brothers, Gene A., to Eltra Corporation. Machine for joining a thermoplastic cap to a thermoplastic tube. 3,895,991, Cl. 156-457.000.

Brown, Boveri & Cie AG: *See—*
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Brown, Boveri & Company Ltd.: *See—*
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Brown, Christopher W.; Ahmadjian, Mark; and Lynch, Patricia F. Petroleum identification. 3,896,312, Cl. 250-343.000.

Brown, Felix H., to Owens-Illinois, Inc. Recording of information from gaseous discharge display/memory panel. 3,896,452, Cl. 346-74.00P.

Brown, Jack T.; Feduska, William; and Bradford, Wesley L., to Westinghouse Electric Corporation. Diffusion-bonded battery electrode plaques. 3,895,960, Cl. 136-36.000.

Brown, Max W., to Texas Instruments Incorporated. Synchronous multi-processor system utilizing a single external memory unit. 3,896,418, Cl. 340-172.500.

Brown, Peter John Nicholas; and Capp, Clifford William, to BP Chemicals International Limited. Process for producing chloroprene. 3,896,181, Cl. 260-655.000.

Brown & Root, Inc.: *See—*
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Bruder, Joseph A.: *See—*
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Brunnmueller, Friedrich; Henkel, Helmut; and Lenz, Johann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of stable urea/formaldehyde resins in a three stage reaction. 3,896,087, Cl. 260-69.00R.

Brunswick Corporation: *See—*
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Bryan, Geoffrey L.: *See—*
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Buchanan, George E.; Krone, Donald R.; Krone, Russell R.; and Noyes, James E. Gasoline dispensing system. 3,895,738, Cl. 222-26.000.

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Bugaut, Andree; and Laudon, Monique, to L'Oreal. Salts of morpholino-(2,3 B) phenox azonium and hair dye and hair setting lotion compositions containing the same. 3,896,117, Cl. 260-242.000.

Bullock, Jonathan S., IV: *See—*
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Bumgardner, Jon H., to United States of America, Navy. High-speed sampler with variable sample rate. 3,896,390, Cl. 328-151.000.

Bunker Ramo Corporation: *See—*
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Burns, Henry Knox, III. Shrink-film packaging method. 3,895,476, Cl. 53-26.000.

Burns, John J., to Lawrence Peska Associates, Inc., a part interest. Holder board for bingo games. 3,895,806, Cl. 273-136.00E.

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Burtelson, Frederick W., to Reliable Electric Company. Combined post tensioning anchor and cable. 3,895,879, Cl. 403-369.000.

Burton, Lawrence A.; and Doos, Gustav W., to Allen-Bradley Company. Enclosed voltage motor control with interlocking elements. 3,896,353, Cl. 317-103.000.

Buschbaum, Edwin; Motschmann, Siegfried; and Strenge, Gert, to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Electrochemical metal-removal method. 3,896,012, Cl. 204-129.460.

Bushey, Albert H.; and McDole, Ewell E., to Kaiser Aluminum & Chemical Corporation. Method of lubricating an aluminum workpiece. 3,895,971, Cl. 148-6.270.

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Cadiou, Jean, to Societe Anonyme Automobiles Citroen. Shutter-type fluid distributor. 3,895,650, Cl. 137-612.000.

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Cakora, Dennis Ronald, to Bunker Ramo Corporation. Supporting device for printed circuit boards. 3,895,719, Cl. 317-101.0DH.

Calabro, Anthony D. Heat dissipator for metal case transistor. 3,896,481, Cl. 357-81.000.

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Campman, James P. Magnetically operated alarm. 3,896,427, Cl. 340-274.00R.

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Olander, Charles C.; and Caparone, Michael J., 3,896,359.

Capp, Clifford William: *See—*
Brown, Peter John Nicholas; and Capp, Clifford William, 3,896,181.

Cappel, Bert; Schuhmann, Siegfried; and Wolf, Klaus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Metering bar assembly for ink fountain roller. 3,895,575, Cl. 101-363.000.

Cardinal of Adrian, Inc.: *See—*
Papsdorf, John W., 3,895,426.

Carl Freudenberg, Firma: *See—*
Heling, Wilhelm; and Ammann, Rudolf, 3,895,665.

Carling O'Keefe Limited: *See—*
Bunnell, Arthur K., 3,895,713.

Carlson, David Emil: *See—*
Goodman, Lawrence Alan; and Carlson, David Emil, 3,896,016.

Carney, Leroy L., to Halliburton Company. Preparation of colloidal solid suspensions in aqueous solutions. 3,896,031, Cl. 252-8.50C.

Carney, Murray C.; and Hart, David G., to Sangamo Electric Company. Load survey recorder including tape cartridge receptacle. 3,896,488, Cl. 360-6.000.

Carre, Roland, to Thomson-CSF. Processing device. 3,896,433, Cl. 343-5.00R.

Carstens, Ronald A.; and Butcher, William J., to Key Chemicals, Inc. Composition for controlling pitch in paper manufacture. 3,896,046, Cl. 252-310.000.

Cartabbia, Giovanni. Ironing machine for ironing shoulders. 3,895,749, Cl. 223-57.000.

Carter, Adolphus J., III. Signal light circuit integrator. 3,896,415, Cl. 340-67.000.

Casida, John E.: *See—*
Tilles, Harry; and Casida, John E., 3,896,169.

Cassez, Pierre; and Pelisson, Claude, to Benoto-Sam. Hoisting winch, in particular for a boring machine. 3,895,779, Cl. 254-150.0FH.

Castarede, Armand, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Structure of internal combustion engines. 3,895,868, Cl. 123-195.00R.

Castillo, Adolfo: *See—*
Jureit, John C.; Kushner, Ben; and Castillo, Adolfo, 3,895,708.

Castle, Clarence L., Jr.: *See—*
Schmitt, James L.; Castle, Clarence L., Jr.; and Kessinger, Orville E., Jr., 3,895,703.

Caterpillar Tractor Co.: *See—*
Muntjanoff, John R., 3,895,694.
Schmitt, James L.; Castle, Clarence L., Jr.; and Kessinger, Orville E., Jr., 3,895,703.

Cavallotti, Claudio: *See—*
Sacrini, Egeo; and Cavallotti, Claudio, 3,896,176.

Cave, David L.; and Davis, Walter R., to Motorola, Inc. Monolithic power amplifier capable of operating class A and class AB. 3,896,393, Cl. 330-22.000.

Central Glass Company Limited: *See—*
Yoshida, Fumio; Sakamoto, Setsuo; and Tatewaki, Shoichi, 3,895,859.

Central Mine Equipment Company: *See—*
Rassieur, Charles L., 3,895,726.

Centre Electronique Horloger S.A.: *See—*
Hammer, Walter; Vittoz, Eric Andre; Hermann, Jean; and Choffat, Hubert, 3,895,486.

Cerf, Peter H., to Braun, Anton. Differential fuel supply system for internal combustion engines. 3,895,618, Cl. 123-127.000.

Certain-Teed Products Corporation: *See—*
Thiessen, Leo K., 3,895,833.

Cesca, Sebastiano: *See—*
Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, 3,896,097.

Ceyzeriat, Louis: *See—*
Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, 3,896,079.

Chabala, Leonard Valentine, to S&C Electric Company. High voltage circuit interrupting device. 3,896,282, Cl. 200-148.00A.

Chai, Sie-Yearl; and Yardley, John P., to American Home Products Corporation. (N-propionyl)-gly-cys-lys-asn-phe-phe-trp-lys-thr-phe-thr-ser-cys-oh and intermediates. 3,896,105, Cl. 260-112.500.

Chamberlain, Richard Travers, to Admiral Corporation. Color television degaussing circuit. 3,896,330, Cl. 315-8.000.

Chambers, Herbert R., to Spencer Industries, Inc. Molded two-part drawer front. 3,895,733, Cl. 220-4.00R.

Chance, James L.; and Han, Shu Tang, to Beloit Corporation. Air impingement system. 3,895,449, Cl. 34-155.000.

Chari, Srinivasan V., to Control Data Corporation. Linear motor. 3,896,319, Cl. 310-14.000.

Charm, Stanley E.; and Wong, Bing Lou, to Research Corporation. Radiommunoassay determining the hepatitis associated antigen content of blood. 3,896,218, Cl. 424-1.000.

Chechulin, Evgeny Arkadievich: *See—*
Feoktistov, Evgeny Ilich; Chechulin, Evgeny Arkadievich; Zonov, Nikolai Semenovich; Prozorov, Leonid Kronidovich; Poskryakov, Jury Maximovich; Kremennoi, Grigory Grigorievich; and Goryachy, Vladimir Mikhailovich, 3,896,281.

Chevron Research Company: *See—*
Franke, Hans G., 3,896,193.
Moore, Joseph E., 3,896,225.
Stayner, Robert A., 3,895,973.

Childs, William V., to Phillips Petroleum Company. Apparatus for separating liquids. 3,896,022, Cl. 204-302.000.

Chitre, Nand Kishore M.; and Pontano, Benjamin Anthony, to COMSAT. Method and instrument for measuring interference between angle modulated systems. 3,896,385, Cl. 325-363.000.

Cho, Mayumi, to Pioneer Electronic Corporation. Four channel stereophonic broadcasting system and receiving device. 3,896,269, Cl. 179-15.0BT.

Choffat, Hubert: *See—*
Hammer, Walter; Vittoz, Eric Andre; Hermann, Jean; and Choffat, Hubert, 3,895,486.

Choy, Daniel S. J. Self propelled conduit traversing device. 3,895,637, Cl. 128-348.000.

Christian, Hubert E., to Dart Industries Inc. Pour spout lid. 3,895,743, Cl. 222-143.000.

Christie, George Johnstone; and Buckwalter, Frank Harold, to Bristol-Myers Company. Anesthetic composition. 3,896,221, Cl. 424-246.000.

Christy, Marcia Elizabeth, to Merck & Co., Inc. Method of treating cardiac arrythmia with phenylalkylaralkylamines. 3,896,237, Cl. 424-330.000.

Chromalloy American Corporation: *See—*
Ellis, John L.; Mal, M. Kumar; and Tarkan, Stuart E., 3,896,244.

Ciba-Geigy AG: *See—*
Helmo, Brunetti; Jakob, Peterli Hans; and Heller, Hansjorg, 3,896,125.

Ciba-Geigy Corporation: *See—*
Drabek, Jozef, 3,896,191.
Gaetzi, Karl, 3,896,160.
Hubele, Adolf, 3,896,224.
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Cicchiello, Frank: *See—*
Sachs, Reynold; and Cicchiello, Frank, 3,896,267.

Cincinnati Milacron Inc.: *See—*
Kinsel, Robert Carl; and Magee, Robert Nick, 3,896,363.

Cisse, Jean: *See—*
Bolling, Gustaf Frederic; and Cisse, Jean, 3,895,941.

Clairol Incorporated: *See—*
Rosenberg, Ira, 3,896,014.

Clark Equipment Company: *See—*
Heggen, John P., 3,895,728.

Clay, Henry J., to Hahn & Clay. Vessel with pre-compressed seal. 3,895,735, Cl. 220-5.00A.

Clement, Clyde H., to Kron, Lester E. Apparatus and method for forming flashings for roof vent pipes. 3,895,467, Cl. 52-199.000.

Cleveland, Joseph J.: *See—*
Mehalchick, Emil J.; Cleveland, Joseph J.; Long, Robert A.; Schulze, Harry O.; and Marshall, Paul K., 3,896,048.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 3,895,967.

Cline, John A.: *See—*
Hoffman, Robert E.; Cline, John A.; Fuselier, Christopher S.; and D'Atre, John D., 3,896,356.

Coal Industry (Patents) Ltd.: *See—*
Martin, David James Reginald, 3,896,380.

Coca-Cola Company, The: *See—*
Malaspina, Alex; and Moretti, Roberto H., 3,896,241.

Cohen, Morton: *See—*
Silverman, Elliott; and Cohen, Morton, 3,895,445.

Colasanti, Arduino: *See—*
Schotthoefer, Jerome W.; and Colasanti, Arduino, 3,895,821.

Cole, Robert B., to Belden Corporation. Coaxial cable with an undulated drain wire. 3,896,261, Cl. 174-115.000.

Coleman, James H.; and Lo, Jyh-Shuey, to Sprague Electric Company. Monolithic ceramic capacitor. 3,896,354, Cl. 317-258.000.

Coleman, Richard L.; Cummins, Billy H.; and Startz, Ambrose J., to Texaco, Inc. Production of improved lubricating oils. 3,896,025, Cl. 208-95.000.

Colgate-Palmolive Company: *See—*
Grimm, John Edward, III, 3,896,033.

Collins, Clifford J. Game device including game board and punch cards for simulating athletic games such as football. 3,895,798, Cl. 273-85.00R.

Combustion Engineering, Inc.: *See—*
Gillette, Carl L.; and Ramey, William M., 3,895,685.

Comercial Super - Dix, S.A.: *See—*
Moran, Gonzalo, 3,895,928.

Commissariat a l'Energie Atomique: *See—*
Delafon, Patrick, 3,896,374.

Communications Satellite Corporation: *See—*
Fariello, Ettore, 3,896,273.
Lindmayer, Joseph, 3,895,975.
Magenheim, Bertram, 3,896,382.

Compagnie Industrielle Radioelectrique: *See—*
Held, George, 3,896,276.

COMSAT: *See—*
Chitre, Nand Kishore M.; and Pontano, Benjamin Anthony, 3,896,385.

Comstock, Lowell Ray: *See—*
Gerkin, Richard Michael; and Comstock, Lowell Ray, 3,896,303.

Comstron Corporation: *See—*
Basse, Philip, 3,896,389.

Conax Corporation: *See—*
Fisher, Edward, 3,895,831.

Condon, James B.: *See—*
Lewis, Philip S., Jr.; Agee, William A.; Bullock, Jonathan S., IV; and Condon, James B., 3,895,935.

Cone, Charles N.; and Steinberg, Julius M., to Pacific Adhesives Company. Plywood manufacture using foamed glues. 3,895,984, Cl. 156-79.000.

Conner, Charles James, to United States of America, Agriculture. Turnbull's blue single bath mineral dyeing process (ferri-zirc) for cellulosic textiles. 3,895,907, Cl. 8-52.000.

Connor, Daniel S.: *See—*
Benjamin, Lawrence; and Connor, Daniel S., 3,896,056.

Constant, James Nickolas. Simple radar for detecting the presence, range and speed of targets. 3,896,435, Cl. 343-9.000.

Continental Can Company, Inc.: *See—*
Friendship, Kenneth F. M., 3,895,478.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Niehus, Gunther; and Voss, Hartwig, 3,895,787.

Continental Oil Company: *See—*
Fertl, Walter H., 3,895,520.
Umphrey, Ronald W., 3,895,644.

Contraves AG: *See—*
Baumann, Emil, 3,895,557.

Control Data Corporation: *See—*
Beecroft, Harold James, 3,896,495.
Chari, Srinivasan V., 3,896,319.

Cook, Allen B. Fluid actuated hammer. 3,895,680, Cl. 173-78.000.

Cook, George E., to Air Products and Chemicals, Inc. Direct current arc power supply. 3,896,287, Cl. 219-131.00R.

Cooke, Maurice Dudley, to BP Chemicals International Limited. Mesityl oxide removal from high-purity phenol. 3,896,006, Cl. 203-28.000.

Copal Company Limited: *See—*
Yaginuma, Jusuke, 3,896,277.

Cornwell, Charles E.: *See—*
Plunguian, Mark; and Cornwell, Charles E., 3,896,060.

Corraz, Alfred John: *See—*
Berger, Leo; and Corraz, Alfred John, 3,896,145.

Corry, Thomas M., to General Motors Corporation. Power center inverter having power center commutation during operation into short circuits. 3,896,365, Cl. 321-5.000.

Corti, Costante: *See—*
Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, 3,896,167.

Cospen, Jean; and Baumann, Bernard, to Societe de Vente de l'Aluminium Pechiney. Process for forming hollow bodies of thermoplastic material. 3,896,207, Cl. 264-322.000.

Cotton Incorporated: *See—*
Garner, Thomas H.; and Webb, Byron K., 3,895,589.

Coulter Electronics, Inc.: *See—*
Ziffer, Garret Francis, 3,895,854.

Coursaut, Henri, to Le Bouchage Mecanique. Closure for receptacles. 3,895,731, Cl. 215-218.000.

Court, William A.: *See—*
Kupchan, S. Morris; Komoda, Yasuo; Thomas, Gareth J.; and Court, William A., 3,896,111.

Courtney, Robert L.: *See—*
Anderson, D. Richard; Courtney, Robert L.; and Harrah, Larry A., 3,896,042.

Courtright, Dennis R.: *See—*
McLaughlin, Joseph K., Jr.; and Courtright, Dennis R., 3,895,687.

Cox, Donald Clyde, to Bell Telephone Laboratories, Incorporated. Linear amplification using quantized envelope components to phase reverse modulate quadrature reference signals. 3,896,395, Cl. 330-53.000.

Craig, Paul N.; and Zirkle, Charles L., to SmithKline Corporation. Substituted 10-heterocyclicaminoalkyl-9,10-dihydroanthracenes. 3,896,133, Cl. 260-293.620.

Crane, Grant: *See—*
Wakefield, Lynn B.; Crane, Grant; and Kay, Edward Leo, 3,896,059.

Crasnianski France S.A.: *See—*
Crasnianski, Serge, 3,895,508.

Crasnianski, Serge, to Crasnianski France S.A. Flat key. 3,895,508, Cl. 70-395.000.

Creative Technology Corporation: *See—*
Rodriquez, Edward T., 3,896,334.

Crist, Philip W.: *See—*
Lester, John M.; Crist, Philip W.; and O'Toole, Charles E., 3,896,439.

Cryenco: *See—*
McIntosh, Glen E.; and Loudon, John D., 3,895,497.

Cullen, Donald L.; and Moore, Teddy L., to Autech Corporation. Laser dimension comparator. 3,895,870, Cl. 356-1.000.

Cummins, Billy H.: *See—*
Coleman, Richard L.; Cummins, Billy H.; and Startz, Ambrose J., 3,896,025.

Curley, Edward M.: *See—*
Bartner, Elliot; Curley, Edward M.; Kaplan, Sheldon; and Sarnoff, Stanley J., 3,895,633.

Curtiss, Alan C.: *See—*
Praglin, Julius; McKie, James E., Jr.; Curtiss, Alan C.; and Longhenry, David K., 3,895,661.

Curtiss-Wright Corporation: *See—*
Loyd, Robert W., Jr.; and Lombaerde, Charles, 3,895,889.

D. Swarovski & Co.: *See—*
Loreck, Walter, 3,895,987.

Daiden Co., Inc.: *See*—
Sakamoto, Akira, 3,895,964.

Dainichi Nippon Cable Co., Ltd.: *See*—
Utumi, Atushi; Fujiwara, Yasuaki; Asai, Akira; and Jitsukawa, Masao, 3,896,198.

Dancy, Julian H., to Texaco Inc. Apparatus and method for washing away an electrostatic charged mist in an oil tanker. 3,896,340, Cl. 317-2.00R.

Dandliker, Rene; Iten, Paul; and Eliasson, Baldur, to Brown, Boveri & Company Ltd. Optical speed-measuring devices and methods for maximizing their accuracies. 3,895,872, Cl. 356-28.000.

Danesh, Andre. Detergent composition. 3,896,040, Cl. 252-89.000.

Daniels, Dennis, to U.S. Amada, Ltd. Extendable arm punching apparatus. 3,895,550, Cl. 83-409.000.

Dardano, Frank S.; and Jacobson, Harvey B. Gravity feed, controlled flow rate plant watering system. 3,895,494, Cl. 61-12.000.

Dart Industries Inc.: *See*—
Christian, Hubert E., 3,895,743.
Swett, James B., 3,895,736.

D'Atre, John D.: *See*—
Hoffman, Robert E.; Cline, John A.; Fuselier, Christopher S.; and D'Atre, John D., 3,896,356.

Davidson, Robert. Speed and/or direction change means. 3,895,540, Cl. 74-800.000.

Davies, John Kyffin; and Cadman, Bernard Victor. Shaft seal. 3,895,813, Cl. 277-88.000.

Davies & Metcalfe Limited: *See*—
Hunter, Ian Pearson, 3,895,695.

Davis, Robert L.: *See*—
Lang, Thomas J.; Lang, Kenneth G.; Lang, Joseph A.; and Davis, Robert L., 3,895,683.

Davis, Sanford. Patient orienting device. 3,895,403, Cl. 5-81.00R.

Davis, Walter R.: *See*—
Cave, David L.; and Davis, Walter R., 3,896,393.

Day, Frederick. Container for cassou straws. 3,895,714, Cl. 206-443.000.

Decker, Hans-Heino, to Rollei-Werke Franke & Heidecke. Electronic flash apparatus. 3,896,337, Cl. 315-241.00P.

de Delas y de Ugarte, Eduardo, to Servicios de Ingenieria, Proyectos Y Estudios/(SIPE). Procedures and facilities employed for eliminating oxygen in oxides. 3,895,782, Cl. 266-24.000.

De Filippi, Robert Joseph: *See*—
Alcorn, Charles Noble; De Filippi, Robert Joseph; Henke, John David; and Liang, Robert Ng, 3,896,317.

Dehmelt, Klaus H. Sealed, gas-tight electric storage battery. 3,895,959, Cl. 136-6.00R.

Deiwick, Horst: *See*—
Manthey, Willi; and Deiwick, Horst, 3,895,498.

de Jonge, Cornelis R. H. I.: *See*—
de Jongh, Hendrik A. P.; and de Jonge, Cornelis R. H. I., 3,896,099.

de Jongh, Hendrik A. P.; and de Jonge, Cornelis R. H. I., to Akzo N.V. Polymerization of ethylenically unsaturated monomers with a 1,1,2,-2-tetracarboalkoxy-diaryl-ethane. 3,896,099, Cl. 260-93.50R.

Del Mar Engineering Laboratories: *See*—
Bachman, John A., 3,895,630.

Delafon, Patrick, to Commissariat a l'Energie Atomique. Method of analog measurement of a capacitance and a capacitance meter for carrying out said method. 3,896,374, Cl. 324-60.00C.

Delest, Rene, to S.A. Ulmer Aeronautique. Head protection enclosure. 3,895,625, Cl. 128-142.000.

Delmore, Daniel A., to Tennant Company. Hydraulic press. 3,895,511, Cl. 72-448.000.

DeLong, Robert J., to Spectrol Electronics Corporation. Indicating device. 3,895,600, Cl. 116-115.000.

Delorme, Raymond Louis, to Societe Honeywell Bull (Societe Anonyme). Process and device for welding of multiwire cables. 3,896,285, Cl. 219-80.000.

Delta Scientific Corporation: *See*—
Ellis, Samuel B., 3,895,649.

Dennison, Allan G.; Bancroft, Martha F.; Smith, Stanley B., Jr.; and Tolkoff, Marc Joshua, to Instrumentation Laboratory, Inc. Spectroscopic analysis apparatus utilizing a tubular heating element and a passive sample holder. 3,895,873, Cl. 356-85.000.

Dennison Manufacturing Company: *See*—
Bone, Arnold R., 3,895,753.

Denoual, Roger, to Establissement Teltest R.D. Electronic calculator. 3,896,290, Cl. 235-61.70R.

DePalma, Joseph S. Dry chemical dispersion nozzle. 3,895,759, Cl. 239-498.000.

de Quervain, Alfred; and Wild, Peter, to Brown, Boveri & Cie AG. Information-bearing devices and projection display systems therefor. 3,895,866, Cl. 353-30.000.

Descleve, Pierre; and Megnin, Jean-Claude, to Groupement Atomique Alsacienne Atlantique. Thermal shock protection for refractory material subject to molten metals. 3,896,247, Cl. 428-65.000.

DeSoto, Inc.: *See*—
Kreider, Robert W., 3,896,138.
Sekmakas, Kazys, 3,896,017.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Haschke, Heinz; Morlock, Gerhard; and Felber, Wilfried, 3,896,086.
Klingler, Karl-Heinz, 3,896,119.

Deutsche Texaco Aktiengesellschaft: *See*—
Rohr, Ulrich, 3,896,412.

de Wit, Michiel; and Hotz, Roddy Fro, to Texas Instruments Incorporated. Acousto-optically Q-switched laser. 3,896,397, Cl. 331-94.50Q.

Dewit, Pieter: *See*—
Halsor, Jack L.; Dewit, Pieter; and Irwin, Edgar L., 3,896,309.

Dexter, John B.: *See*—
Maughlin, Richard K.; and Dexter, John B., 3,895,767.

DeZuba, George P.; Berger, Abe; and Selin, Terry G., to General Electric Company. Silyl cyanurates. 3,896,123, Cl. 260-248.0CS.

Diagnostic Instruments, Inc.: *See*—
Jvirblis, Alex E.; and Roth, Walter, 3,896,310.

DiBuono, Frank M. Shaving moisturizer. 3,895,437, Cl. 30-90.000.

Dickey, Charles R., to Bray Oil Company. High basic sulfonate process. 3,896,037, Cl. 252-33.400.

Dickey, Clarence A.; and McDaniel, John E., to Glasrock Products, Inc. Method of producing spherical thermoplastic particles. 3,896,196, Cl. 264-6.000.

Dickinson, Brian Arthur Leonard, to Pye Limited. Analogue-to-digital converters. 3,896,431, Cl. 340-347.0NT.

Dickinson, Timothy: *See*—
Olney, Norman Seth; and Dickinson, Timothy, 3,895,481.

Diepers, Heinrich; Jablonski, Karl-Heinz; and Lamamatsch, Hans, to Siemens Aktiengesellschaft. Method of electrically joining together two bimetal tubular superconductors. 3,895,432, Cl. 29-599.000.

Diethelm, Matthew A.: *See*—
Lange, Ronald E.; Diethelm, Matthew A.; and Ishmael, Phillip C., 3,896,419.

Digney, Kenneth A.; and Gallauresi, Alfred P. Method of treating sewage to enhance aerobic decomposition. 3,896,027, Cl. 210-14.000.

Dillard, John W.; Tringali, Dominick; Swartz, Richard L.; and Hinson, Ernest M., Jr., to Universal Business Machines, Inc. Automatic article sorting and punching machine. 3,896,300, Cl. 235-153.00R.

DiLorenzo, James Vincent; Niehaus, William Charles; and Rode, Daniel Leon, to Bell Telephone Laboratories, Incorporated. Gallium arsenide Schottky barrier avalance diode array. 3,896,473, Cl. 357-15.000.

Di Lorenzo, James Vincent; and Rozgonyi, George Arthur, to Bell Telephone Laboratories, Incorporated. Reduced stresses in III-V semiconductor devices. 3,896,479, Cl. 357-71.000.

Di Loreto, Edward. Safety tip air nozzle. 3,895,757, Cl. 239-291.000.

Dimensional Development Corporation: *See*—
Lo, Allen Wah; and Nims, Jerry Curtis, 3,895,867.

Di Renna, Edmond F. Aquarium water heater. 3,896,289, Cl. 219-523.000.

Doderer-Winkler, Alfred: *See*—
van der Buylton-Domgraff, Ralph; and Doderer-Winkler, Alfred, 3,895,740.

Doerges, Alexander: *See*—
Bratzler, Karl; Doerges, Alexander; and Schlauer, Johann, 3,896,215.

Dolphin International, Inc.: *See*—
Bokenkamp, Donald G., 3,895,677.

Door Controls Incorporated: *See*—
Maynard, Ralph D., Jr.; and Lirette, Douglas E., 3,895,461.

Doos, Gustav W.: *See*—
Burton, Lawrence A.; and Doos, Gustav W., 3,896,353.

Dorst-Keramikmaschinen-Bau Inh. Otto Dorst u. Dipl.-Ing. Walter Schlegel: *See*—
Marker, Harald; and Leingartner, Josef, 3,895,895.

Doshi, Mahendra R.: *See*—
Gill, William N.; Doshi, Mahendra R.; and Adams, Robert E., 3,895,958.

Douglas, Donald J. Flexibly hinged eye piece headgear. 3,895,397, Cl. 2-14.00W.

Dow Badische Company: *See*—
Harder, Richard E.; and Ticknor, Leland B., 3,895,908.

Dow Chemical Company, The: *See*—
Beck, Henry Nelson, 3,896,100.
Goralski, Christian T., 3,896,122.
Plepys, Raymond A.; and Jezic, Zdravko, 3,896,140.
Tuttle, Carole K., 3,896,252.

Dowling, Donald J.; and Boyd, John F., to Texaco Inc. Permeability logging method using apparatus comprising current electrodes between electromagnets, current electrode on the surface and acoustic listening devices to detect pressure related noise. 3,896,413, Cl. 340-15.5BH.

Drabek, Jozef, to Ciba-Geigy Corporation. O-ethyl-s-m-Propyl-O-(2,6-dichloro-4-bromophenyl)phosphorothiolate. 3,896,191, Cl. 260-964.000.

Drader, Clarence. Nesting-stacking carrier having hinged side walls. 3,895,715, Cl. 206-506.000.

Drake, Charles A., to Phillips Petroleum Company. Two stage catalytic hydrogenation of unsaturated dinitriles employing ruthenium, nickel or mixture thereof as catalytic agent. 3,896,173, Cl. 260-583.00P.

Drake, Charles A., to Phillips Petroleum Company. Catalytic hydrogenation of unsaturated dinitriles employing ruthenium, nickel or mixture thereof as catalytic agent. 3,896,174, Cl. 260-583.00P.

Dransch, Gunther; and Horlein, Gerhard, to Hoechst Aktiengesellschaft. Process for the preparation of substituted benzimidazoles. 3,896,142, Cl. 260-309.200.

Dravis, Charles A.: *See*—
Bashline, John D.; Dravis, Charles A.; and Frye, Richard D., 3,895,663.

Dresser Industries, Inc.: *See*—
Wright, Charles L.; and Williams, Billy C., 3,895,678.

Dubeck, Michael; and Lech, Leon, to Ethyl Corporation. HCl Treatment of copper sulfide minerals. 3,896,208, Cl. 423-27.000.

Dukette, William J., to American Associated Cybernetics, Inc. Sensor responsive cybernetics machine. 3,895,729, Cl. 214-152.000.

Dulux Australia Ltd.: *See—*
Gunning, Raymond Harry; and Lubbock, Frederick John, 3,895,826.

Dumas, Guy H., to Silec-Semi-Conducteurs. Processes for the localized and deep diffusion of gallium into silicon. 3,895,976, Cl. 148-187.000.

Dungan, Dennis F.: *See—*
Micheli, Adolph L.; and Dungan, Dennis F., 3,896,409.

Dunkelmann, Guenter: *See—*
Kast, Hellmut; and Dunkelmann, Guenter, 3,896,128.

Dunlop Holdings Limited: *See—*
Mitchell, William E., 3,895,667.

du Pont de Nemours, E. I., and Company: *See—*,
Bouchard, Robert Joseph; and Rogers, Donald Burl, 3,896,055.
Fournier, Louis Byron; and Meyer, Raymond Alan, 3,896,209.
Goodman, Albert; and Suwyn, Mark A., 3,896,204.
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Klopping, Hein L., 3,896,230.
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Poirier, Robert Victor, 3,896,071.
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Reardon, Joseph Edward; and Wolff, Vernon Clare, Jr., 3,896,065.
Resnick, Paul Raphael, 3,896,179.
Wat, Edward Koon Wah, 3,896,115.

Dworak, Dennis D., to Atlantic Richfield Company. Method of forming co-precipitated material. 3,896,049, Cl. 252-466.00J.

Dyck, Rudolph H.: *See—*
Amelio, Gilbert F.; and Dyck, Rudolph H., 3,896,474.

Dynamit Nobel Aktiengesellschaft: *See—*
Gawlick, Heinz; Kuschel, Hans; Marondel, Gunther; Siegelin, Werner; and Spranger, Wolfgang, 3,895,579.

E. L. Mustee & Sons, Inc.: *See—*
Mustee, Bernard E., 3,895,398.

Eagleson, John M., Jr., to Baker Company, Inc., The. Air-insulated work station. 3,895,570, Cl. 98-115.0LH.

Early, James M., to Fairchild Camera and Instrument Corporation. Charge-coupled device with overflow protection. 3,896,485, Cl. 357-24.000.

Ebata, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. End stop member for sliding clasp fasteners. 3,895,418, Cl. 24-205.11F.

Echida, Nobuhiro: *See—*
Kosaka, Yujiro; Kuroki, Hitoshi; Echida, Nobuhiro; Otomo, Kanji; and Uemura, Masaru, 3,896,069.

Eckert, George W.: *See—*
Schlicht, Raymond C.; and Eckert, George W., 3,895,925.

Eckert, Hans-Werner; Nikolaus, Peter; and Werner, Claus, to Henkel and Cie GmbH. Softening agent compositions. 3,896,034, Cl. 252-8.800.

Edax International Inc.: *See—*
Barnhart, Morris W., 3,896,296.

Edwards, Clyde A. Adjustable insole and method. 3,895,405, Cl. 12-146.00M.

Edwards, John A.: *See—*
Berkoz, Belig M.; Edwards, John A.; and Fried, John H., 3,896,139.

Edwards, William J., to Honeywell Information Systems Inc. Magnetic ball retaining apparatus. 3,895,846, Cl. 308-10.000.

Efimov, Ivan Ivanovich; Lifshits, Mikhail Lvovich; Nikiforov, Dmitry Dmitrievich; Ivanov, Viktor Pavlovich; Linetsky, Lev Efimovich; Lazarev, Vadim Georgievich; and Brenin, Alexandr Ivanovich. Device for focussing and deflection of an electron beam in a cathoderay apparatus. 3,896,339, Cl. 315-403.000.

Ehman, Michael F.; and Austerman, Stanley B., to Rockwell International Corporation. Growth of incongruently melting crystals from a quaternary silicate system using the czochralski method. 3,895,921, Cl. 23-301.0SP.

Ehrenberg, Henry; and Hirsch, Mordechai-Gustav, to Snel AG. Hand tool. 3,895,439, Cl. 30-171.000.

Eichelberger, Charles W.; and Garratt, Philip M., to General Electric Company. Acoustic imaging apparatus for visual display with depth perception. 3,895,525, Cl. 73-67.900.

Eickmeyer, Allen G. Method and compositions for removing acid gases from gaseous mixtures and reducing corrosion of ferrous surface areas in gas purification systems. 3,896,212, Cl. 423-223.000.

Eisai Company, Ltd.: *See—*
Sato, Kikumasa; Inoue, Seiichi; Kijima, Shizumasa; and Hamamura, Kimio, 3,896,153.

Electronic Camshaft Corporation: *See—*
Ule, Louis A., 3,896,346.

Elfstrand, Stig Olof. Apparatus for spontaneous or artificial respiration. 3,895,626, Cl. 128-145.800.

El Guindy, Samir, to Spotnails, Inc. Pneumatically powered fastener-driving tool. 3,895,562, Cl. 91-308.000.

Eliasson, Baldur: *See—*
Dandliker, Rene; Iten, Paul; and Eliasson, Baldur, 3,895,872.

Elitex, Zavody textilniho strojirenstvi generalni reditelstvi: *See—*
Bilek, Jan, 3,895,657.

Ellingson, Erling. Device for supporting a bucket on a ladder. 3,895,772, Cl. 248-210.000.

Elliott, Floyd R.: *See—*
Mahlandt, Lavern N.; Smith, John R.; Elliott, Floyd R.; and Greene, Larry D., 3,895,623.

Ellis, Daniel A.; and Luckenbill, Lawrence F., to Mueller Co. Collet compression connection. 3,895,832, Cl. 285-322.000.

Ellis, John L.; Mal, M. Kumar; and Tarkan, Stuart E., to Chromalloy American Corporation. Method of producing plasma sprayed titanium carbide tool steel coatings. 3,896,244, Cl. 427-34.000.

Ellis, Samuel B., to Delta Scientific Corporation. Electric Hosecock. 3,895,649, Cl. 137-595.000.

Elmer, Otto C., to General Tire & Rubber Company, The. Bonding glass fibers to rubber. 3,896,253, Cl. 428-382.000.

Elster, AG: *See—*
Paetzold, Wolf, 3,895,530.

Eltra Corporation: *See—*
Brothers, Gene A., 3,895,991.

Emerson Electric Co.: *See—*
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Enck, Richard S., Jr.; and Sackinger, James P., to Varian Associates. Electron optical system. 3,896,331, Cl. 315-17.000.

Endo, Kunio; Kawarada, Junji; Sueishi, Motoharu; Harada, Susumu; and Norimatsu, Hideaki, to Nippondenso Co., Ltd. Air-fuel ratio feedback type fuel injection system. 3,895,611, Cl. 123-32.0EA.

Endo, Masaaki: *See—*
Akazaki, Shigeru; Endo, Masaaki; and Shinozaki, Mamoru, 3,895,495.

Enersorb Limited: *See—*
Thomson, Ian M., 3,895,835.

Engelhardt, Gunther: *See—*
Keck, Johannes; and Engelhardt, Gunther, 3,896,141.

England, Will Clarke. Rollable fulcrum balancing board recreational and exercise device provided with non-linear stabilization features. 3,895,794, Cl. 272-1.00R.

Engle, Thomas H.; Bohusch, Glen O.; and Bogenschutz, Thomas M., to General Signal Corporation. Electropneumatic trainline connector. 3,895,850, Cl. 339-15.000.

English, Melvin M.: *See—*
May, Michael; and English, Melvin M., 3,896,292.

Enos, Madge I. Game. 3,895,805, Cl. 273-135.00F.

Enthone, Incorporated: *See—*
Fadgen, Earl J., Jr., 3,896,043.

Entwistle, Ian D.: *See—*
Howard, Colin C.; Johnstone, Robert A. W.; and Entwistle, Ian D., 3,896,002.

Envirotech Corporation: *See—*
Gelfand, Peter Charles, 3,896,347.

Epton, Roger; Holloway, Christopher; and McLaren, John Vincent. Material for gel permeation chromatography. 3,896,092, Cl. 260-80.30N.

Erichsen, Herman W., to Tyco Laboratories, Inc. Proximity detector. 3,896,425, Cl. 340-258.00B.

Ericsson, Ellerth: *See—*
Andersson, Olle; and Ericsson, Ellerth, 3,896,406.

Eriksson, Bjorn: *See—*
Jysky, Goran; Mardla, Ilmar; and Eriksson, Bjorn, 3,895,929.

Ernsthausen, Roger E., to Owens-Illinois, Inc. Gaseous discharge device having lower operating voltages of increased uniformity. 3,896,323, Cl. 313-188.000.

Eskeli, Michael. Turbine with dual rotors. 3,895,491, Cl. 60-650.000.

Esquire, Inc.: *See—*
Long, Clifton W., 3,896,407.

Essex International, Inc.: *See—*
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Establissement Teltest R.D.: *See—*
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Estes, Clarence F., Jr.: *See—*
Bales, Emmett R.; and Estes, Clarence F., Jr., 3,895,670.

Etablissements d'Occident: *See—*
Panigati, Pier Luigi, 3,895,815.

Etat Francais: *See—*
Lagofun, Guy Jean, 3,895,552.

Ethyl Corporation: *See—*
Dubeck, Michael; and Lech, Leon, 3,896,208.
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Europatent S.A.: *See—*
Buergers, August, 3,895,413.

Exxon Research & Engineering Co.: *See—*
McGowan, H. Christopher; Male, Joseph A.; and McLaren, Malcolm G., 3,895,963.

Eysn, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Tiltable converter. 3,895,786, Cl. 266-36.00P.

F. G. Kretschmer & Co.: *See—*
Makay, Nicolas, 3,895,980.

F. N. Burt Company, Inc.: *See—*
Rosenburg, Charles W., Jr., 3,895,754.

Fabre, Carlo. Composition assembly comprising constructional elements of plastic material for making free scheme compositions. 3,895,456, Cl. 46-30.000.

Fabris, Hubert Jakob; Uelzmann, Heinz; and Van Essen, Willem Johannes, to General Tire & Rubber Company, The. Modified polyvinyl chloride. 3,896,091, Cl. 260-78.40D.

Fadgen, Earl J., Jr., to Enthone, Incorporated. Non-cyanide alkaline composition for dissolving non-ferrous metals. 3,896,043, Cl. 252-186.000.

Fagherazzi, Giuliano; Ferrero, Francesco; and Accattino, Gianfranco, to Montecatini Edison S.p.A. Process for the preparation of barium titanate. 3,896,216, Cl. 423-598.000.

Fail Safe Brake Corporation: *See—*
Fontaine, John G., 3,895,698.

Fair, Walter R. Auxiliary snow body. 3,895,842, Cl. 298-1.00R.

Fairchild Camera and Instrument Corporation: *See—*
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Early, James M., 3,896,485.

Fairey Stainless Limited: *See—*
Thomas, Lindsay Maitland, 3,895,734.

Fannon, Robert D., Jr., to Harsco Corporation. Automatic window washer. 3,895,406, Cl. 15-302.000.

Fariello, Ettore, to Communications Satellite Corporation. Digital echo suppressor. 3,896,273, Cl. 179-170.600.

Farrell, Thomas C.: *See—*
Blakeslee, Dirk C.; and Farrell, Thomas C., 3,895,532.

Fazio, Robert L.: *See—*
Gerding, Charles Christian; Aukrust, Egil; and Fazio, Robert L., 3,895,673.

Fearon, Robert L., to London Concrete Machinery Co. Supplementary wheel set for road vehicles. 3,895,818, Cl. 280-81.00R.

Fedorovsky, Eduard Fedorovich: *See—*
Kozhevnikov, Sergei Nikolaevich; Tkachenko, Arkady Semenovich; and Fedorovsky, Eduard Fedorovich, 3,895,510.

Feduska, William: *See—*
Brown, Jack T.; Feduska, William; and Bradford, Wesley L., 3,895,960.

Fegan, Joseph J., to Lawrence Peska Associates, Inc., a part interest. Tie tree. 3,895,750, Cl. 223-65.000.

Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, to Lovens Kemiske Fabrick Produktionsaktieselskab. Benzoic acid derivatives. 3,896,165, Cl. 260-517.000.

Felber, Wilfried: *See—*
Haschke, Heinz; Morlock, Gerhard; and Felber, Wilfried, 3,896,086.

Felderhof, Jan Frederik; and Westwood, James William Alfred. Fluid activated vibratory device. 3,895,561, Cl. 91-20.000.

Feller, Rudolf: *See—*
Gerber, Jean-Pierre; and Feller, Rudolf, 3,895,485.

Feoktistov, Evgeny Ilich; Chechulin, Evgeny Arkadievich; Zonov, Nikolai Semenovich; Prozorov, Leonid Kronidovich; Poskryakov, Jury Maximovich; Kremennoi, Grigory Grigorievich; and Goryachy, Vladimir Mikhailovich. Magnetically actuated liquid level signalling device. 3,896,281, Cl. 200-84.00C.

Fernholz, Werner: *See—*
Bockau, Gustav; Gormann, Willi; Fernholz, Werner; and Frenyo, Pal, 3,895,705.

Ferranti Limited: *See—*
Bedford, John, 3,896,378.

Ferraris, Giuseppe: *See—*
Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, 3,896,097.

Ferrero, Francesco: *See—*
Fagherazzi, Giuliano; Ferrero, Francesco; and Accattino, Gianfranco, 3,896,216.

Fertl, Walter H., to Continental Oil Company. Well logging method using well logging tools run through a drill stem test string for determining in-situ change in formation water saturation values. 3,895,520, Cl. 73-152.000.

Fielder, William Vanburen, Jr.: *See—*
Znamirowski, Henry; and Fielder, William Vanburen, Jr., 3,895,410.

Finch, Robert A.: *See—*
Peterson, Richard H.; and Finch, Robert A., 3,895,555.

Finckh, Hermann; and Trabler, Martin, to Westinghouse Electric Corporation. Gas turbine for use in a closed cycle plant. 3,895,887, Cl. 417-408.000.

Finike Italiana Marposs, s.a.s.: *See—*
Pozzetti, Mario, 3,895,526.

Fink, Robert, to Inglis Nurseries, Inc. Roller attachment for trucks. 3,895,880, Cl. 404-86.000.

Firestone Tire & Rubber Company, The: *See—*
Wakefield, Lynn B.; Crane, Grant; and Kay, Edward Leo, 3,896,059.

Fischer, Adolf: *See—*
Hamprecht, Gerhard; Koenig, Karl-Heinz; and Fischer, Adolf, 3,896,155.

Fischer, Edward L., to Indiana National Bank, The. Mail order sales device. 3,895,576, Cl. 101-369.000.

Fischer, Klaus: *See—*
Steinhauer, Ernst Wilhelm; Fischer, Klaus; and Lower, Oskar, 3,895,472.

Fisher, Edward, to Conax Corporation. Seal assembly providing dual seal zones. 3,895,831, Cl. 285-93.000.

Fisher, Howard M., to Pennsylvania Engineering Corporation. Cooling assembly for steel converter vessels. 3,895,783, Cl. 266-35.000.

Fishman, Jack, to Lewinstein, Evalina; Hirsch, Henry; and Rothschild, Stanley. 6-Methylene-6-desoxy dihydro morphine and codeine derivatives and pharmaceutically acceptable salts thereof, and use of the same as a narcotic antagonist. 3,896,226, Cl. 424-260.000.

Fisons Limited: *See—*
Gates, Peter Stuart, 3,896,151.

Fitzroy, Nancy D.; Mann, Ronald L.; Gerling, Henry B.; and Reale, John D., to United States of America, Army. Hardened antenna element cover. 3,896,450, Cl. 343-797.000.

Flannery, William E., to Sperry Rand Corporation. Bi-directional magnetic domain transfer circuit. 3,896,421, Cl. 340-174.0TF.

Fletcher, Ralph P., Jr.; and Pratt, Ted C., to Wiretech Corporation. Wire coiling system. 3,895,762, Cl. 242-54.00R.

FMC Corporation: *See—*
Vadas, Leslie, 3,896,243.

Fohl, Timothy, to GTE Sylvania Incorporated. Metal halide discharge lamp having expanded section arc tube. 3,896,326, Cl. 313-220.000.

Fomby, Kenneth A. Applicator brush and method of making same. 3,895,877, Cl. 401-129.000.

Fontaine, John G., to Fail Safe Brake Corporation. Brake control apparatus. 3,895,698, Cl. 192-3.0TR.

Ford Motor Company: *See—*
Bolling, Gustaf Frederic; and Cisse, Jean, 3,895,941.
Harrison, Robert S., 3,896,195.
Schubeck, Phillip A., 3,895,615.

Fornes Puget, Enrique, to Nuclear Iberica S.A. Construction of radioactive lightning arresters. 3,896,342, Cl. 317-61.000.

Forster, Friedrich; Barth, Erich; and Keller, Heinz-Jochen, to Friedrich Uhde GmbH. Device for the production of a homogenous gas mixture. 3,895,919, Cl. 23-288.00K.

Forster, Siegfried; Hewing, Gunter; and Quell, Peter, to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. Power plant. 3,895,492, Cl. 60-659.000.

Forward, Robert W.: *See—*
Killen, Charles W.; and Forward, Robert W., 3,896,448.

Foseco International Limited: *See—*
Ravault, Frank Ernest George, 3,895,917.

Fosslien, Egil, to University of Missouri, The Curators of the. Automated electrophoresis instrument. 3,896,021, Cl. 204-299.000.

Foster, Berry W. Engine and gas generator. 3,895,620, Cl. 123-197.00R.

Foster Grant Co., Inc.: *See—*
Lang, Theo O.; and Lane, Thomas A., 3,895,983.

Fournier, Louis Byron; and Meyer, Raymond Alan, to du Pont de Nemours, E. I., and Company. Reduction of hexavalent chromium. 3,896,209, Cl. 423-55.000.

Fraim, Freeman W.; and Murphy, Preston V., to Thermo Electron Corporation. Electret Earphone. 3,896,274, Cl. 179-111.00E.

Franke, Hans G., to Chevron Research Company. Process for preparing N-actyl-O-hydrocarbylphosphoroamidothioate metal salts. 3,896,193, Cl. 260-987.000.

Frantz, Claude. Circuit for reducing turn-on and turn-off times of inductive loads. 3,896,367, Cl. 323-6.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 3,895,583.

Fraser, R. Lee. Process for the manufacture of low cost housing at the site. 3,895,473, Cl. 52-745.000.

Freeman, Harlan G.: *See—*
Baxter, Gene F.; Freeman, Harlan G.; and Tiedeman, George T., 3,896,081.

Freeman, Percy F. Baler structure with needle actuated release mechanism for tension control. 3,895,571, Cl. 100-4.000.

French, John A.; and Turner, John C., to Schweppes Limited. Handling of thin walled containers. 3,895,660, Cl. 141-172.000.

Frenyo, Pal: *See—*
Bockau, Gustav; Gormann, Willi; Fernholz, Werner; and Frenyo, Pal, 3,895,705.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Dihydo 2-naphthylacetic acid derivatives. 3,896,157, Cl. 260-469.000.

Fried, John H.: *See—*
Berkoz, Belig M.; Edwards, John A.; and Fried, John H., 3,896,139.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Biermann, Klaus; Burbach, Jurgen; Gimpel, Horst; and Zirpins, Burckhard, 3,895,894.
Schwarz, Wilhelm, 3,895,502.

Friedman, David Warren. Electronic selection bingo game unit. 3,895,807, Cl. 273-138.00A.

Friedrich Uhde GmbH: *See—*
Forster, Friedrich; Barth, Erich; and Keller, Heinz-Jochen, 3,895,919.

Friendship, Kenneth F. M., to Continental Can Company, Inc. Roll on capping head. 3,895,478, Cl. 53-77.000.

Froehlking, Adolf, to Omark Industries, Inc. Stud escapement mechanism. 3,895,431, Cl. 221-233.000.

Frumkin, Mikhail Evseevich: *See—*
Anikanov, Nikolai Ivanovich; Baburin, Evgeny Arkadievich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Frumkin, Mikhail Evseevich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,566.

Fry, William Lawrence, to Rist's Wires & Cables Limited. Wiring harness with mounting device and method of making same. 3,896,259, Cl. 174-72.00A.

Frye, Richard D.: *See—*
Bashline, John D.; Dravis, Charles A.; and Frye, Richard D., 3,895,663.

Fuji Photo Film Co., Ltd.: *See—*
Hamada, Yoichi, 3,896,467.
Kato, Hajime; and Hayashi, Takao, 3,896,255.
Kubotera, Kikuo; Mizuki, Eiichi; and Fujiwara, Tadahiro, 3,895,946.
Shiba, Keisuke; Kubodera, Seiiti; Ohi, Reiichi; Shishido, Tadao; Yamamoto, Nobuo; and Sakai, Takeo, 3,895,948.

Fujii, Yoshishige: *See—*
Tanzawa, Hiroshi; Sakai, Yoshitada; Matsushita, Takao; Fujii, Yoshishige; Sugita, Kouji; and Maekawa, Haruki, 3,896,061.

Fujiki, Tokio: *See—*
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; Kimura, Masatoshi; and Saito, Mitsutaka, 3,896,067.

Fujitsu Limited: *See—*
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Fujiwara, Tadahiro: *See—*
Kubotera, Kikuo; Mizuki, Eiichi; and Fujiwara, Tadahiro, 3,895,946.

Fujiwara, Yasuaki: *See—*
Utumi, Atushi; Fujiwara, Yasuaki; Asai, Akira; and Jitsukawa, Masao, 3,896,198.

Fukuda, Seiwa: *See—*
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Fuselier, Christopher S.: *See—*
Hoffman, Robert E.; Cline, John A.; Fuselier, Christopher S.; and D'Atre, John D., 3,896,356.

Futami, Takehiro: *See—*
Yano, Takeshi; Futami, Takehiro; and Ookura, Mototsugu, 3,896,401.

Gaetzi, Karl, to Ciba-Geigy Corporation. Amidinocarbamates. 3,896,160. Cl. 260-482.00C.

Gallauresi, Alfred P.: *See—*
Digney, Kenneth A.; and Gallauresi, Alfred P., 3,896,027.

Gallego, Steve F. Locking closure for fuel tank. 3,895,506. Cl. 70-168.000.

Galloway, Charles H. Modular kennel building. 3,895,606. Cl. 119-16.000.

Galves, Jean Pierre; and Reboul, Jean Philippe, to Thomson-CSF. Gas-discharge display panel with matrix of orthogonal insulating layers. 3,896,324. Cl. 313-190.000.

Galvin, James Murry. Holding means for holding a roll or sheet film holder in press and view cameras. 3,896,464. Cl. 354-161.000.

Ganguly, Ashit K.: *See—*
Shapiro, Elliot L.; and Ganguly, Ashit K., 3,896,220.

Garin, Maurice. Microtome-blade sharpening machine. 3,895,462. Cl. 51-85.0BS.

Garlock Inc.: *See—*
Cairns, James, 3,896,036.

Garner, Thomas H.; and Webb, Byron K., to Cotton Incorporated. Seed planting apparatus. 3,895,589. Cl. 111-7.000.

Garratt, Philip M.: *See—*
Eichelberger, Charles W.; and Garratt, Philip M., 3,895,525.

Garrett, Donald E. Method of producing coarse potash. 3,895,920. Cl. 23-298.000.

Gasner, Lawrence L.: *See—*
Lange, K. Robert; Stern, Arthur M.; Gasner, Lawrence L.; and Hsu, Yuan Tsun, 3,895,996.

Gates, Peter Stuart, to Fisons Limited. 2-Halo-2,3-dihydrobenzofuran-5-olesters of sulfonic acids. 3,896,151. Cl. 260-346.20R.

Gavin, Frederick David, Jr.: *See—*
Adams, George Phillip; Gavin, Frederick David, Jr.; and Natale, Anthony Pete, 3,895,434.

Gawlick, Heinz; Kuschel, Hans; Marondel, Gunther; Siegelin, Werner; and Spranger, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Irritant agent device. 3,895,579. Cl. 102-65.200.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Bockau, Gustav; Gormann, Willi; Fernholz, Werner; and Frenyo, Pal, 3,895,705.

Gehrig, Reinhold: *See—*
Mengeringhausen, Max; Quenzel, Hermann; Gehrig, Reinhold; and Spanheimer, Willi, 3,895,789.

Geiger, Julius; Meinhardt, Gunter; and Wagenknecht, Werner, to Agfa-Gevaert Aktiengesellschaft. Photographic material with improved antistatic properties. 3,895,950. Cl. 96-87.00A.

Gelfand, Peter Charles, to Envirotech Corporation. Corona wind generating device. 3,896,347. Cl. 317-262.00E.

General Aviation Electronics, Inc.: *See—*
Atkinson, Lowell G., 3,896,445.
Henderson, Claude L., 3,896,384.

General Computing Corporation: *See—*
Kaufman, Burton; and Schneider, Bruce H., 3,895,865.

General Electric Company: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 3,895,967.
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General Motors Corporation: *See—*
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Richard, Raymond L., Jr.; and Sampatacos, Peter M., 3,895,811.
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General Signal Corporation: *See—*
Engle, Thomas H.; Bohusch, Glen O.; and Bogenschutz, Thomas M., 3,895,850.

General Tire & Rubber Company, The: *See—*
Elmer, Otto C., 3,896,253.
Fabris, Hubert Jakob; Uelzmann, Heinz; and Van Essen, Willem Johannes, 3,896,091.

Georgiade, Nicholas G. Apparatus for use in treatment of the bilateral cleft lip and palate condition in infants. 3,895,624. Cl. 128-76.00R.

Gerber, Arthur H., to Horizons Incorporated. Heterocyclic polymers from triaminopyradine compounds. 3,896,083. Cl. 260-47.0CP.

Gerber, Arthur H.: *See—*
Reynard, Kennard A.; Gerber, Arthur H.; and Rose, Selwyn H., 3,896,058.

Gerber, Jean-Pierre; and Feller, Rudolf, to Zenith Time S.A. Timepiece click device. 3,895,485. Cl. 58-4.00R.

Gerding, Charles Christian; Aukrust, Egil; and Fazio, Robert L., to Jones & Laughlin Steel Corporation. Gas cover for casting machine. 3,895,673. Cl. 164-259.000.

Gerkin, Richard Michael; and Comstock, Lowell Ray, to Union Carbide Corporation. Polyepoxide-caprolactone polyols and coatings based thereon. 3,896,303. Cl. 260-78.30R.

Gerling, Henry B.: *See—*
Fitzroy, Nancy D.; Mann, Ronald L.; Gerling, Henry B.; and Reale, John D., 3,896,450.

Gersamia, Eduard Galaktionovich: *See—*
Arakelov, Mikhail Alexandrovich; Gersamia, Eduard Galaktionovich; Zedgenidze, Tengiz Grigorievich; and Nozadze, Gennady Pavlovich, 3,895,423.

Gerster, John F., to Riker Laboratories, Inc. Substituted benzo(ij)quinolizine-2-carboxylic acids and derivatives thereof. 3,896,131. Cl. 260-287.00R.

Gertsch AG: *See—*
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Gertsch, Ernst; and Gertsch, Ulrich, to Gertsch AG. Safety ski binding. 3,895,817. Cl. 280-11.35K.

Gertsch, Ulrich: *See—*
Gertsch, Ernst; and Gertsch, Ulrich, 3,895,817.

Giarrante, Gary C. Tub shower spray diverter. 3,895,399. Cl. 4-149.000.

Gibbons, Martin D.: *See—*
Wilson, Ronald H.; Gibbons, Martin D.; and Blumenfeld, Samuel M., 3,895,430.

Giles, Walter B.: *See—*
Savkar, Sudhir D.; Giles, Walter B.; and Tatge, Robert B., 3,895,686.

Gill, William N.; Doshi, Mahendra R.; and Adams, Robert E., to J. W. Greer, Inc. Continuous flow counter-current liquid and solid contact apparatus. 3,895,958. Cl. 134-60.000.

Gillespie, John Francis, to Saguaro Industries, Inc. Method of making synthetic resin surface covering including use of two heat transfer modes. 3,896,197. Cl. 264-40.000.

Gillette, Carl L.; and Ramey, William M., to Combustion Engineering, Inc. Method and apparatus for ultrasonic inspection of weldments. 3,895,685. Cl. 181-.500.

Gillette Company, The: *See—*
Nissen, Warren I., 3,895,905.

Gimpel, Horst: *See—*
Biermann, Klaus; Burbach, Jurgen; Gimpel, Horst; and Zirpins, Burckhard, 3,895,894.

Ginnasi, Alessandro: *See—*
Rescalli, Carlo; Rebora, Pierluigi; and Ginnasi, Alessandro, 3,896,007.

Givaudan Corporation: *See—*
Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,896,175.

Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, to A/S Ardal OG Sunndal Verk. Dynamic vacuum treatment to produce aluminum alloys. 3,895,937. Cl. 75-68.00R.

Glasrock Products, Inc.: *See—*
Dickey, Clarence A.; and McDaniel, John E., 3,896,196.

Glass, Marvin I.: *See—*
Morrison, Howard J.; Keller, Albert G.; and Glass, Marvin I., 3,895,459.

Glenn, Robert: *See—*
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Glise, Andre: *See—*
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Goldansky, Vitaly Iosifovich: *See—*
Bolshakov, Alexandr Ivanovich; Mikhailov, Alfa Ivanovich; Barkalov, Igor Mstislavovich; and Goldansky, Vitaly Iosifovich, 3,896,084.

Goldman, Marvin A., to Penn-Plax Plastics, Inc. Aquarium equipment organizer. 3,895,605. Cl. 119-5.000.

Gollwitzer, Leonhard: *See—*
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Goltz, Kurt: *See—*
Blum, William A.; and Goltz, Kurt, 3,895,970.

Goodman, Albert; and Suwyn, Mark A., to du Pont de Nemours, E. I., and Company. Melt-extrusion of acrylonitrile polymers into filaments. 3,896,204, Cl. 264-206.000.

Goodman, Lawrence Alan; and Carlson, David Emil, to RCA Corporation. Fabrication of liquid crystal devices. 3,896,016, Cl. 204-180.00R.

Goralski, Christian T., to Dow Chemical Company, The. Morpholine derivatives of 3,4,5-trichloro-2,6-pyridinedicarbonitrile. 3,896,122, Cl. 260-247.50G.

Goransson, Rolf Erik, to Siporex-Francais S.A.R.L. Combined lifting and cutting means for unhardened cellular concrete bodies. 3,895,551, Cl. 83-453.000.

Gordon, John Ashley: *See*—
Barrett, Robert; and Gordon, John Ashley, 3,896,416.

Gormann, Willi: *See*—
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Gornott, Dietmar: *See*—
Rudert, Frithjof; Muller, Rolf; and Gornott, Dietmar, 3,896,489.

Goryachy, Vladimir Mikhailovich: *See*—
Feoktistov, Evgeny Ilich; Chechulin, Evgeny Arkadievich; Zonov, Nikolai Semenovich; Prozorov, Leonid Kronidovich; Poskryakov, Jury Maximovich; Kremennoi, Grigory Grigorievich; and Goryachy, Vladimir Mikhailovich, 3,896,281.

Gotz, Manfred K.: *See*—
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Graafsma, Richard S.; and Morgan, George H., to Auto Specialties Manufacturing Co. Screw jack pinion gear and method of making same. 3,895,422, Cl. 29-159.200.

Grachev, Leonid Pavlovich: *See*—
Anikanov, Nikolai Ivanovich; Baburin, Evgeny Arkadievich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Frumkin, Mikhail Evseevich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,566.
Anikanov, Nikolia Ivanovich; Grachev, Leonid Pavlovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,707.

Graham, Richard G. Motor driven dolly actuator for semi-trailers and similar vehicles. 3,895,682, Cl. 180-1.00R.

Grau, Gerhard, to Zinser Textilmaschinen GmbH. Apparatus for cleaning spinning rotors. 3,895,483, Cl. 57-56.000.

Grawcock, Patrick L., to Essex International, Inc. Apparatus and method for forming circular dynamoelectric machine field windings by pushing. 3,895,659, Cl. 140-92.100.

Green, Willard B., Jr.: *See*—
Woodilla, John E., Jr.; Hunt, Gordon W.; and Green, Willard B., Jr., 3,895,972.

Greene, Larry D.: *See*—
Mahlandt, Lavern N.; Smith, John R.; Elliott, Floyd R.; and Greene, Larry D., 3,895,623.

Greer, James E., to Burlington Industries, Inc. Process for thermosol dyeing of polyester fabrics. 3,895,909, Cl. 8-176.000.

Greive, Aloys; and Tiemann, Theodor, to Hamel GmbH Zwirnmaschinen. Spinning apparatus. 3,895,484, Cl. 57-58.740.

Griffin, Colin John; and Griffin, Kerry Charles. Load indicating assembly. 3,895,681, Cl. 177-141.000.

Griffin, Kerry Charles: *See*—
Griffin, Colin John; and Griffin, Kerry Charles, 3,895,681.

Griffiths, Barrie William: *See*—
Venables, John Anthony; Pollard, Peter John; and Griffiths, Barrie William, 3,896,308.

Grimm, John Edward, III, to Colgate-Palmolive Company. Encapsulated fabric softener. 3,896,033, Cl. 252-8.800.

Grinbaum, Aron; and Jakubowicz, Solomon. Jimmy proof guard for door. 3,895,834, Cl. 292-346.000.

Groupement Atomique Alsacienne Atlantique: *See*—
Descleve, Pierre; and Megnin, Jean-Claude, 3,896,247.

Gruette, Friedrich-Karl; Schulze, Juergen; and Hampel, Heinz-Georg, to Akademie der Wissenschaften der DDR. Preparation of simulated human milk. 3,896,240, Cl. 426-271.000.

Gruss, George A., to General Electric Company. Electrically heated transparent panel. 3,895,433, Cl. 29-611.000.

Grychtol, Klaus: *See*—
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GTE Automatic Electric Laboratories Incorporated: *See*—
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GTE Information Systems Incorporated: *See*—
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GTE Sylvania Incorporated: *See*—
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Mehalchick, Emil J.; Cleveland, Joseph J.; Long, Robert A.; Schulze, Harry O.; and Marshall, Paul K., 3,896,048.
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Guicheteau, Eugene H., to Honeywell Inc. Self-powered thyristor trigger circuit. 3,896,355, Cl. 318-207.000.

Guldberg, Jens: *See*—
Nathanson, Harvey C.; and Guldberg, Jens, 3,896,338.

Gulf Research & Development Company: *See*—
Hartle, Robert J., 3,896,038.

Gunning, Raymond Harry; and Lubbock, Frederick John, to Dulux Australia Ltd. Process of making dispersion of urea-formaldehyde resins. 3,895,826, Cl. 260-33.60R.

Gustav F. Gerdts KG: *See*—
Willenbrock, Helmut; and Schittek, Friedrich, 3,895,647.

Gutridge, Ian Paul, to International Nickel Company, Inc., The. Electrodeposition of iron active mass. 3,895,961, Cl. 136-76.000.

Hagaman, Boynton Craig. Gutter levelling device. 3,895,769, Cl. 248-48.200.

Hahn & Clay: *See*—
Clay, Henry J., 3,895,735.

Haldeman, Charles W., to Megatech Corporation. Gas analyzing. 3,895,915, Cl. 23-254.00R.

Hale, Gordon B., to Outboard Marine Corporation. Track with anti-side slip and traction bar. 3,895,845, Cl. 305-35.0EB.

Hallenbeck, Emerson J. Consumable weld insert. 3,895,924, Cl. 29-183.000.

Halliburton Company: *See*—
Carney, Leroy L., 3,896,031.
Manson, Charles D., Jr., 3,895,829.

Halmekyto, Kaarlo: *See*—
Hiltunen, Mikko; and Halmekyto, Kaarlo, 3,895,711.

Halsor, Jack L.; Dewit, Pieter; and Irwin, Edgar L., to Westinghouse Electric Corporation. Radiation detecting device. 3,896,309, Cl. 250-211.00J.

Hamada, Ben. Tailgate mount. 3,895,838, Cl. 296-57.00R.

Hamada, Yoichi, to Fuji Photo Film Co., Ltd. Compact photographic camera. 3,896,467, Cl. 354-204.000.

Hamamura, Kimio: *See*—
Sato, Kikumasa; Inoue, Seiichi; Kijima, Shizumasa; and Hamamura, Kimio, 3,896,153.

Hamel GmbH Zwirnmaschinen: *See*—
Greive, Aloys; and Tiemann, Theodor, 3,895,484.

Hametta, Allen W. Metal detector with a resonating circuit being driven by a frequency higher than its natural resonance frequency. 3,896,371, Cl. 324-3.000.

Hamilton, Joseph R., to Lynch Corporation. Continuous motion glass molding machine with gob delivery means. 3,895,931, Cl. 65-207.000.

Hammer, Walter; Vittoz, Eric Andre; Hermann, Jean; and Choffat, Hubert, to Centre Electronique Horloger S.A. Timekeeper. 3,895,486, Cl. 58-23.00R.

Hampel, Heinz-Georg: *See*—
Gruette, Friedrich-Karl; Schulze, Juergen; and Hampel, Heinz-Georg, 3,896,240.

Hamprecht, Gerhard; Koenig, Karl-Heinz; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Oxime ethers. 3,896,155, Cl. 260-465.00E.

Han, Shu Tang: *See*—
Chance, James L.; and Han, Shu Tang, 3,895,449.

Hanada, Hiroshi; and Kitajima, Nobuo, to Canon Camera Kabushiki Kaisha. Method for the preparation of CdS or CdSe powder for electrophotography. 3,895,943, Cl. 96-1.500.

Hancox, Roger John, to Accles & Shelvoke Limited. Firearms for use in the humane slaughtering of animals. 3,895,454, Cl. 42-1.00M.

Hanks, Charles W. Electron beam gun system. 3,896,258, Cl. 13-31.000.

Hansen, Richard C.: *See*—
Kramell, Hans P.; and Hansen, Richard C., 3,895,791.

Hanson, Alden B.; and Hanson, Chris A., to Hanson Industries Inc. Children's ski boot. 3,895,452, Cl. 36-2.5AL.

Hanson, Chris A.: *See*—
Hanson, Alden B.; and Hanson, Chris A., 3,895,452.

Hanson Industries Inc.: *See*—
Hanson, Alden B.; and Hanson, Chris A., 3,895,452.

Hara, Takao; and Murayama, Yukio, to Fujitsu Limited. Frame synchronization system. 3,896,265, Cl. 178-69.50R.

Harada, Susumu: *See*—
Endo, Kunio; Kawarada, Junji; Sueishi, Motoharu; Harada, Susumu; and Norimatsu, Hideaki, 3,895,611.

Harder, Richard E.; and Ticknor, Leland B., to Dow Badische Company. Autoclaving procedure for textile fibers. 3,895,908, Cl. 8-130.100.

Hardman, T. J.: *See*—
Bouchy, Jean C.; and Hardman, T. J., 3,895,519.

Hardy, Paul Martin; Kenner, George Wallace; Sheppard, Robert Charles; Morley, John Selwyn; and MacLeod, John Keith, to Imperial Chemical Industries Limited. Acylated derivatives of trp-met-asp-phe-$NH_2$. 3,896,103, Cl. 260-112.500.

Harfenist, Morton, to Burroughs Wellcome Co. Anthelmintic ethers and composition thereof. 3,896,235, Cl. 424-324.000.

Harle & Lechopiez: *See*—
Mayor, Yoland Pierre Paul; and Tord, Pierre Francois, 3,896,211.

Harnden, John D., Jr., to General Electric Company. Semiconductor device with housing of varistor material. 3,896,480, Cl. 357-80.000.

Harr, Hugh, Jr. Bi-metallic seal. 3,895,812, Cl. 277-32.000.

Harrah, Larry A.: *See*—
Anderson, D. Richard; Courtney, Robert L.; and Harrah, Larry A., 3,896,042.

Harris Corporation: *See*—
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Harris-Intertype Corporation: *See*—
Richardson, James Ivor, 3,896,377.
Sarka, Albert J., 3,895,947.

Harris, William A. Portable document and form presentation device. 3,895,847, Cl. 312-100.000.

Harris, William G., to United States of America, Energy Research and Development Administration. Inlet flow distributor for a heat exchanger. 3,895,674, Cl. 165-134.000.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 3,896,157.

Harrison, Robert S., to Ford Motor Company. Acceleration responsive supplemental fuel supply for variable area venturi carburetor. 3,896,195, Cl. 261-44.00R.

Harsco Corporation: *See*—
Fannon, Robert D., Jr., 3,895,406.

Hart, David G.: *See*—
Carney, Murray C.; and Hart, David G., 3,896,488.

Hartel, Kurt: *See*—
Rochling, Hans; and Hartel, Kurt, 3,896,120.

Hartle, Robert J., to Gulf Research & Development Company. Lubricating oil containing a polyamide pour point depressant. 3,896,038, Cl. 252-51.50A.

Hartshorn, David W.: *See*—
Whitehouse, David R.; and Hartshorn, David W., 3,896,396.

Haruo, Niimi: *See*—
Noriyuki, Nagaoka; and Haruo, Niimi, 3,895,662.

Harvell, Don L., to Singer Company, The. Drill and blade holder for portable electric tool. 3,895,710, Cl. 206-349.000.

Harvey, Merlin P.: *See*—
Nudenberg, Walter; Harvey, Merlin P.; and Mann, James Urquhart, 3,896,186.

Haschke, Heinz; Morlock, Gerhard; and Felber, Wilfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the preparation of biodegradable polycarboxylates. 3,896,086, Cl. 260-67.0UA.

Haselton, Thomas Parker, to General Electric Company. Engine igniter tip connector with compensation for differential thermal expansion. 3,896,344, Cl. 317-96.000.

Hashimoto, Masami: *See*—
Mita, Masazo; and Hashimoto, Masami, 3,895,699.

Hashimoto, Teiji; Takigawa, Tomoshi; and Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Electromagnetic release devices for cameras. 3,895,863, Cl. 352-176.000.

Hashimoto, Yoshihiro: *See*—
Inaba, Seiuemon; Shimizu, Kanryo; Hashimoto, Yoshihiro; Amemiya, Youichi; and Usami, Hiroshi, 3,896,361.

Hatayama, Shigefumi; and Tsunekawa, Masao, to Hilti Aktiengesellschaft. Explosive powder driven setting gun with silencing device. 3,895,752, Cl. 227-10.000.

Hatsukano, Yoshikazu; and Shimada, Shunji, to Hitachi, Ltd. Synchronizing signal generator device. 3,896,388, Cl. 328-63.000.

Hatsukano, Yoshikazu, to Hitachi, Ltd. Driving system or liquid crystal display device. 3,896,430, Cl. 340-336.000.

Haupt, Robert C., to Allis-Chalmers Corporation. Friction block for lever. 3,895,679, Cl. 172-9.000.

Hautau, Charles F., to Vulcan Tool Company. Machine tool. 3,895,424, Cl. 29-38.00C.

Haws, Melburn W., to Armour and Company. Apparatus for removing hides from animal carcasses. 3,895,416, Cl. 17-21.000.

Hayasaka, Toshimi: *See*—
Yoshida, Isamu; and Hayasaka, Toshimi, 3,895,770.

Hayashi, Takao: *See*—
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Hayashi, Yutaka: *See*—
Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, 3,895,978.

Hayden, Julian D., to Syndyne Corporation. Two-stage push button switch. 3,896,283, Cl. 200-159.00R.

Haydon, Arthur W., to Tri-tech, Inc. Counting device. 3,896,298, Cl. 235-92.00C.

Haywood, Fred F.: *See*—
Becker, Klaus H.; Haywood, Fred F.; Perdue, Philip T.; and Thorngate, John H., 3,896,306.

Haywood, George Robert, to National Research Development Corporation. Production of shaped articles from paper sludge. 3,895,997, Cl. 162-100.000.

Haywood, George Robert; and Plumstead, Alan David, to National Research Development Corporation. Production of shaped articles from paper sludge. 3,895,998, Cl. 162-100.000.

Hazemag Dr. E. Andreas KG: *See*—
Rosner, Kurt, 3,895,916.

Heathcote, Vincent Albert, to M-O Valve Company Limited, The. High power quick starting magnetron. 3,896,332, Cl. 315-39.510.

Heeling, G. Geert G. Security door. 3,895,669, Cl. 160-92.000.

Heggen, John P., to Clark Equipment Company. Tractor vehicle having material handling subframe. 3,895,728, Cl. 214-140.000.

Heinrich, Burton O.: *See*—
McCulloch, Paul L.; and Heinrich, Burton O., 3,895,968.

Held, George, to Compagnie Industrielle Radioelectrique. Matrix type slide switch assembly. 3,896,276, Cl. 200-16.00R.

Heling, Wilhelm; and Ammann, Rudolf, to Carl Freudenberg, Firma. Reinforcement for rubber tires. 3,895,665, Cl. 152-357.000.

Heller, Hansjorg: *See*—
Helmo, Brunetti; Jakob, Peterli Hans; and Heller, Hansjorg, 3,896,125.

Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, to Givaudan Corporation. 3,7-Dimethyl-octa-2,6-dienyl-mercaptan. 3,896,175, Cl. 260-609.00R.

Helmo, Brunetti; Jakob, Peterli Hans; and Heller, Hansjorg, to Ciba-Geigy AG. O-hydroxyphenyl-s-triazines. 3,896,125, Cl. 260-249.500.

Heminway, John R.; and Sanborn, Herbert M., to United States of America, Army. Correlation processor. 3,896,442, Cl. 343-18.00E.

Henderson, Albert J.; and Krol, John E., to Neville Chemical Company. Process for the liquid phase chlorination of C6–C18 Alpha-olefin hydrocarbons. 3,896,183, Cl. 260-660.000.

Henderson, Claude L., to General Aviation Electronics, Inc. Dual mount electronic device. 3,896,384, Cl. 325-352.000.

Heners, Juergen: *See*—
Broecker, Franz Josef; Heners, Juergen; Marosi, Laszlo; Schwarzmann, Matthias; and Laurer, Peter Rudolf, 3,896,053.

Henke, John David: *See*—
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Henkel and Cie GmbH: *See*—
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Henkel, Helmut: *See*—
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Henry, Raymond, to Thomson-CSF. Mesa type junction inverted and bonded to a heat sink. 3,896,478, Cl. 357-56.000.

Hercules Incorporated: *See*—
Klug, Eugene D., 3,896,107.
Klug, Eugene D., 3,896,108.
Zebree, David T., 3,895,577.

Hermann, Jean: *See*—
Hammer, Walter; Vittoz, Eric Andre; Hermann, Jean; and Choffat, Hubert, 3,895,486.

Herndon, John W., to United States of America, Navy. Rear-screen wide-angle on-axis projection system. 3,895,861, Cl. 352-69.000.

Herold, Albert J.; Koch, Paul E.; and Adams, Richard C., to Standard Oil Company, The. Plastics extrusion die head improvement. 3,895,900, Cl. 425-466.000.

Hester, Jackson B., Jr., to Upjohn Company, The. 2,3-Dehydro-1H-1,4-benzodiazepines. 3,896,109, Cl. 260-239.0BD.

Hewing, Gunter: *See*—
Forster, Siegfried; Hewing, Gunter; and Quell, Peter, 3,895,492.

Higuma, Toyonori, to Kabushiki Kaisha Yashica. Camera exposure control system having a damping coil. 3,896,461, Cl. 354-44.000.

Hihn, Gerhard: *See*—
Stoll, Kurt; and Hihn, Gerhard, 3,895,648.

Hilti Aktiengesellschaft: *See*—
Hatayama, Shigefumi; and Tsunekawa, Masao, 3,895,752.

Hiltunen, Mikko; and Halmekyto, Kaarlo, to Oy Transpak Ab Consulting. Wrapped, preferably cylindrical, product and a method of farming said product. 3,895,711, Cl. 206-413.000.

Hinson, Ernest M., Jr.: *See*—
Dillard, John W.; Tringali, Dominick; Swartz, Richard L.; and Hinson, Ernest M., Jr., 3,896,300.

Hiraiwa, Takashi: *See*—
Saguchi, Kenji; and Hiraiwa, Takashi, 3,895,994.

Hirdler, Louis C., to Olin Corporation. Process for disposing of off-gases containing carbon dioxide and chlorine. 3,896,213, Cl. 423-232.000.

Hiri, Yoshiyuki: *See*—
Kotone, Akira; Hiri, Yoshiyuki; and Masada, Tadashi, 3,896,149.

Hirsch, Henry: *See*—
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Hirsch, Mordechai-Gustav: *See*—
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Hitachi, Ltd.: *See*—
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Hodogaya Chemical Co., Ltd.: *See*—
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Hoechst Aktiengesellschaft: *See*—
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Wiedemann, Wolfgang; and Zimmer, Horst, 3,895,944.

Hoerner Waldorf Corporation: *See*—
Sieffert, William G., 3,895,712.

Hoeschele, Guenther Kurt, to du Pont de Nemours, E. I., and Company. Stabilization of polymers containing poly(alkylene oxide) units. 3,896,078, Cl. 260-45.9NC.

Hoff, Seymour: *See*—
Buckles, Richard G.; Hoff, Seymour; Kehr, Sharon; and Yum, Su Il, 3,895,631.

Hoffman, Robert E. Milling machine. 3,895,559, Cl. 90-14.000.

Hoffman, Robert E.; Cline, John A.; Fuselier, Christopher S.; and D'Atre, John D., to General Electric Company. Method and control system for improved stability of an induction motor via independent voltage, synchronous frequency, and slip frequency control at an operating point. 3,896,356, Cl. 318-227.000.

Hoffman, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2,6,10-Trimethyldodeca-2,6,11-trien-10-ol-1-al-2,6-dimethyl-2,6-undecadien-10-on-1-al and their acetals and processes for their production. 3,896,150, Cl. 260-340.700.

Hoffmann-La Roche Inc.: *See*—
Berger, Leo; and Corraz, Alfred John, 3,896,145.
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Holmes, Edward S. B., to Microsystems International Limited. Thin-film microelectronic resistors. 3,896,284, Cl. 338-48.000.
Holmes, Horace D., to Masco Corporation. Universal joint. 3,895,501, Cl. 64-8.000.
Holtschmidt, Ulrich; and Schwarzmann, Gunter, to Th. Goldschmidt AG. 1-Dodecylaminomethyl-2-amino-cyclopentane. 3,896,171, Cl. 260-563.00R.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sakurai, Yoshitoshi, 3,895,617.
Takahashi, Noriyuki; Miyahara, Hiromitsu; and Inoue, Hidehiko, 3,895,816.
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Honeywell Inc.: *See—*
Guicheteau, Eugene H., 3,896,355.
Leidy, Lester R., Jr., 3,896,408.
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Honeywell Information Systems Inc.: *See—*
Edwards, William J., 3,895,846.
Lange, Ronald E.; Diethelm, Matthew A.; and Ishmael, Phillip C., 3,896,419.
Hook, Cecil Hugh Ridler, to Johns-Manville Corporation. Rotary valve having an improved air seal. 3,895,745, Cl. 222-368.000.
Hooker Chemicals & Plastics Corporation: *See—*
Linder, Jerome; and Weil, Edward D., 3,895,934.
Miller, George T., 3,896,250.
Hope, Henry F.; and Hope, Stephen F. Dryer rack. 3,895,450, Cl. 34-155.000.
Hope, Stephen F.: *See—*
Hope, Henry F.; and Hope, Stephen F., 3,895,450.
Hopkins, Neil E., to Borg-Warner Corporation. Absorption refrigeration system and method. 3,895,499, Cl. 62-101.000.
Horak, Hobbs H. Telescopic flick knife. 3,895,441, Cl. 30-162.000.
Horizons Incorporated: *See—*
Gerber, Arthur H., 3,896,083.
Reynard, Kennard A.; Gerber, Arthur H.; and Rose, Selwyn H., 3,896,058.
Horlein, Gerhard: *See—*
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Hosterman, Harry L., to Portage Newspaper Supply Co. Phototypesetting machine. 3,896,454, Cl. 354-15.000.
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de Wit, Michiel; and Hotz, Roddy Fro, 3,896,397.
Houlihan, William J.; and Manning, Robert E., to Sandoz, Inc. Substituted benzylidene hydrazines as anti-migraine syndrome agents. 3,896,232, Cl. 424-326.000.
Hovekamp, John C., to Buckler Industries, Inc. Automatic processor for offset plates. 3,896,470, Cl. 354-317.000.
Howard, Colin C.; Johnstone, Robert A. W.; and Entwistle, Ian D., to Shell Oil Company. Production of brefeldin-A. 3,896,002, Cl. 195-81.000.
Howard, James C., to United States of America, General Counsel-Code GP. G-load measuring and indicator apparatus. 3,895,521, Cl. 73-178.00R.
Howat, Manuel G. Self-regulating vane type valve for controlling fluid flow. 3,895,646, Cl. 137-468.000.
Howes, Harold L., Jr.: *See—*
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Hoyer, August; and Nekula, Ronald M., to Xerox Corporation. Movable bail bar. 3,895,790, Cl. 271-10.000.
Hsu, Yuan Tsun: *See—*
Lange, K. Robert; Stern, Arthur M.; Gasner, Lawrence L.; and Hsu, Yuan Tsun, 3,895,996.
Huang, Ho-Chung; and San-Paolo, Angela, to RCA Corporation. Method of making a semiconductor device. 3,895,429, Cl. 29-580.000.
Hubele, Adolf, to Ciba-Geigy Corporation. 1-(4',6'-Dichloro-s-triazin-2-ylcarbamoyl)-2-methoxy- carbonylamino-benzimidazole. 3,896,224, Cl. 424-249.000.
Hudson, Ed D.; and Mallory, Merrit L., to United States of America, Energy Research and Development Administration. All-magnetic extraction for cyclotron beam reacceleration. 3,896,392, Cl. 328-234.000.
Hudson, Joseph F., to Monsanto Company. Blow needle assembly. 3,895,897, Cl. 425-182.000.
Hudspeth, Thomas; Rosen, Harold A.; and Walsh, Bernard L., Jr., to Hughes Aircraft Company. Subscription television jamming system. 3,896,262, Cl. 178-5.100.
Hughes Aircraft Company: *See—*
Hudspeth, Thomas; Rosen, Harold A.; and Walsh, Bernard L., Jr., 3,896,262.
Moyer, Norman E.; and Walker, Dennis E., 3,896,429.
Hull, Ezekiel H.: *See—*
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Hunt, Gordon W.: *See—*
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Hunter, Ian Pearson, to Davies & Metcalfe Limited. Spring applied fluid released brake unit. 3,895,695, Cl. 188-170.000.
Hunter, Lee. Steering wheel turning device. 3,895,545, Cl. 74-494.000.
Hush Company, Inc.: *See—*
Johnson, Howard R., 3,895,607.
Hutson, Jearld L. Multilayer semiconductor switching devices. 3,896,477, Cl. 357-39.000.
Hyde, James Stewart, to Varian Associates. Coaxial line to microwave cavity coupling section comprising a waveguide beyond cutoff. 3,896,400, Cl. 333-21.00R.
Hydroacoustics, Incorporated: *See—*
McLaughlin, Joseph K., Jr.; and Courtright, Dennis R., 3,895,687.
Hydroperfect-International H P I: *See—*
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Ichiyanagi, Toshikazu; and Ogiso, Mitsutoshi, to Canon Kabushiki Kaisha. Remote control unit with display device. 3,896,315, Cl. 307-112.000.
Ichiyanagi, Toshikazu: *See—*
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ICN Pharmaceuticals, Inc.: *See—*
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Iijima, Yasuo; and Tanaka, Kenji, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for indicating the unbalanced condition of a rotating body. 3,895,535, Cl. 73-462.000.
Ikegami, Yoshizo, to Konan Camera Research Institute. System for recording photo-images of an object. 3,896,263, Cl. 178-6.800.
Illinois Tool Works Inc.: *See—*
Sharp, Larry L., 3,895,774.
Ilmeg AB: *See—*
Jysky, Goran; Mardla, Ilmar; and Eriksson, Bjorn, 3,895,929.
Imai, Isao: *See—*
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Imperial Chemical Industries Limited: *See—*
Hardy, Paul Martin; Kenner, George Wallace; Sheppard, Robert Charles; Morley, John Selwyn; and MacLeod, John Keith, 3,896,103.
Inaba, Seiuemon; Shimizu, Kanryo; Hashimoto, Yoshihiro; Amemiya, Youichi; and Usami, Hiroshi, to Fujitsu Limited. Method and apparatus for compensating an error in numerical control. 3,896,361, Cl. 318-616.000.
Indian Head, Inc.: *See—*
Robinson, Richard L.; and Volgyesy, Ivan L., 3,895,732.
Indiana National Bank, The: *See—*
Fischer, Edward L., 3,895,576.
Industrial Clean Air, Inc.: *See—*
Miller, Edward M., 3,895,569.
Industrial Filter and Pump Mfg. Co.: *See—*
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Industrie Pirelli, S.p.A.: *See—*
Tangorra, Giorgio, 3,895,668.
Ingestad, Nils Torsten; and Molin, Nils Ludvig, to AB Marabou. Process and medium for the cultivation of microorganisms to achieve optimum growth and yield. 3,896,003, Cl. 195-100.000.
Inglis Nurseries, Inc.: *See—*
Fink, Robert, 3,895,880.
Inland Container Corporation: *See—*
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Takahashi, Noriyuki; Miyahara, Hiromitsu; and Inoue, Hidehiko, 3,895,820.
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International Flavors & Fragrances Inc.: *See—*
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International Harvester Company: *See—*
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International Nickel Company, Inc., The: *See—*
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International Telephone and Telegraph Corporation: *See—*
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International Tools (1973) Ltd.: *See—*
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Ionics, Incorporated: *See—*
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Ishibashi, Akichika: *See—*
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Ishida, Yoshihiro: *See—*
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Ishigaki, Yukinobu; Ohwaki, Isao; Sasamura, Kohei; and Ohba, Masahiro, to Victor Company of Japan, Ltd. System for a multichannel record disc with crosstalk compensation provided during recording. 3,896,271, Cl. 179-100.4ST.
Ishimaru, Toshiyasu; and Kodama, Yutaka, to Toyama Chemical Co., Ltd. Process for producing 7-aminocephalosporanic acids. 3,896,118, Cl. 260-243.00C.
Ishmael, Phillip C.: *See—*
Lange, Ronald E.; Diethelm, Matthew A.; and Ishmael, Phillip C., 3,896,419.
Isoya, Toshiro; Kakuta, Rinichi; and Kawamura, Chikayuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of sebacic acid. 3,896,011, Cl. 204-59.00R.
Itagaki, Takuo: *See—*
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Iten, Paul: *See—*
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Ito, Shin: *See—*
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Ito, Tadao. Spinal column warming treatment apparatus. 3,895,638, Cl. 128-379.000.
Itoh, Yasuo: *See—*
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J. W. Greer, Inc.: *See—*
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Jablonski, Karl-Heinz: *See—*
Diepers, Heinrich; Jablonski, Karl-Heinz; and Lamamatsch, Hans, 3,895,432.
Jackson, Lynden Ashbrooke, to Post Office, The. Dielectric waveguide filters. 3,896,402, Cl. 333-73.00W.
Jacob, Carlyle W., to United States of America, Navy. Voltage supply for radio proximity fuze. 3,895,581, Cl. 102-70.20P.
Jacob, Ingolf: *See—*
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Jacobs, James P.: *See—*
Schisselbauer, John C.; and Jacobs, James P., 3,896,294.
Jacobsen, Stephen C. Fluid system and method for coding information. 3,895,641, Cl. 137-1.000.
Jacobson, Harvey B.: *See—*
Dardano, Frank S.; and Jacobson, Harvey B., 3,895,494.
Jacoby, Charles H., to Akzona Incorporated. Dust entrapment composition. 3,896,039, Cl. 252-88.000.
Jacques, Albert M. V., to Amchem Products, Inc. Purification of aliphatic phosphonic acids. 3,896,163, Cl. 260-502.40R.
Jaeger, Ben E. Method and apparatus for cleaning vessels. 3,895,756, Cl. 239-227.000.
Jaenke, Hans-Jurgen: *See—*
Bechstein, Herbert; Jaenke, Hans-Jurgen; Muller, Rolf; Ritter, Ernst; Staudt, Heinrich; Tomasch, Helmut; and Urlberger, Alois, 3,895,537.
Jager, Gerhard; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Plant growth regulants comprising 2-hydroxyethyl-1-pyridinium-(1) salts. 3,895,933, Cl. 71-94.000.
Jakob, Peterli Hans: *See—*
Helmo, Brunetti; Jakob, Peterli Hans; and Heller, Hansjorg, 3,896,125.
Jakubowicz, Solomon: *See—*
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Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Automatic exposure control system. 3,896,458, Cl. 354-30.000.
Johnson, Dwight N., to JH Industries, Inc. Fluid level control valve. 3,895,645, Cl. 137-403.000.
Johnson, Gerald Frederic, to Minister of Aviation, in Her Majesty's Government of the United Kingdom of Great Britain & Northern Ireland. Doppler radar receiver. 3,896,436, Cl. 343-16.00M.
Johnson, Howard R., to Hush Company, Inc. Fire tube furnace. 3,895,607, Cl. 122-156.000.
Johnson & Johnson: *See—*
Shepherd, Robert Carl, 3,895,751.
Johnson, Larry K., to Lawrence Brothers, Inc. Pivot assembly. 3,895,412, Cl. 16-151.000.
Johnson, Lavell R., to Summa Corporation. Method and apparatus for radioimmunoassay with regeneration of immunoadsorbent. 3,896,217, Cl. 424-1.000.
Johnson, Matthey & Co. Limited: *See—*
Keeling, Robert Alan; and Priest, John Garrick, 3,896,249.
Johnson Service Company: *See—*
Broker, David C.; and Wisniewski, Judith L., 3,896,205.
Johnston, Charles James. Illuminated fishing lures. 3,895,455, Cl. 43-17.600.
Johnstone, Robert A. W.: *See—*
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Jones, Charles B., Jr.: *See—*
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Jones & Laughlin Steel Corporation: *See—*
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Jonnet, Albert G., to Koppers Company, Inc. Dry coke cooler. 3,895,448, Cl. 34-65.000.
Jos. Schneider & Co.: *See—*
Korpert, Heinz, 3,896,466.
Joshi, Suryakant, to Klockner-Humboldt-Deutz Aktiengesellschaft. Air-cooled injection internal combustion engine with turbulence chamber. 3,895,613, Cl. 123-32.00C.
Josteit, Heinz, to Rheinische Braunkohlenwerke AG. Process for joining strips of belt along their lengthwise running side edges. 3,895,990, Cl. 156-304.000.
Joullie, Maurice; Lakah, Lucien; Maillard, Gabriel F.; and Muller, Pierre, to Recherches Pharmaceutiques et Scientifiques. S-(β-substitutedamino-ethyl)-cysteine. 3,896,121, Cl. 260-247.10R.
Juchniewicz, Romuald, to Politechnika Gdanska. Method of protecting tin-packaging against corrosion and making them glossy. 3,895,910, Cl. 21-2.70R.
Jureit, John C.; Kushner, Ben; and Castillo, Adolfo, to Automated Building Components, Inc. Connector plate coil. 3,895,708, Cl. 206-53.000.
Jurovsky, Albert Yakovlevich. Differential pressure gauge. 3,895,524, Cl. 73-393.000.
Justus, George Junior; Miller, Lowell C.; and Patrick, Charles T., Jr., to NDM Corporation. Electrosurgical grounding cable assembly. 3,895,635, Cl. 128-303.130.
Jvirblis, Alex E.; and Roth, Walter, to Diagnostic Instruments, Inc. Field control in imaging systems. 3,896,310, Cl. 250-315.000.
Jysky, Goran; Mardla, Ilmar; and Eriksson, Bjorn, to Ilmeg AB. Device for collecting drill dust. 3,895,929, Cl. 55-334.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kaiser, Ado; Bretschneider, Hermann; and Hohenlohe-Oehringen, Kraft, to Hoffmann-La Roche Inc. Formyl-substituted tyrosine. 3,896,166, Cl. 260-519.000.
Kaiser Aluminum & Chemical Corporation: *See—*
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Kakuta, Rinichi: *See*—
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Kamekura, Masahiro; and Onishi, Hiroshi, to Noda Institute for Scientific Research. Halophilic nuclease and a process for producing the same. 3,896,000, Cl. 195-62.000.

Kamiyama, Seiichi: *See*—
Yonemitsu, Eiichi; Kamiyama, Seiichi; Kanada, Toshiaki; and Nagai, Norio, 3,896,185.

Kampf, Richard S., to Beckman Instruments, Inc. Spring loading for the stylus of a pressure-sensitive chart recorder. 3,896,453, Cl. 346-139.00C.

Kanada, Toshiaki: *See*—
Yonemitsu, Eiichi; Kamiyama, Seiichi; Kanada, Toshiaki; and Nagai, Norio, 3,896,185.

Kaneda, Tokuzo, to Ricoh Co., Ltd. Automatic separation device for copying apparatus. 3,895,792, Cl. 271-172.000.

Kapitan, John R. Roof and wall panel system. 3,895,469, Cl. 52-595.000.

Kaplan, Sheldon: *See*—
Bartner, Elliot; Curley, Edward M.; Kaplan, Sheldon; and Sarnoff, Stanley J., 3,895,633.

Kashio, Hidetora: *See*—
Toyoda, Yasushi; and Kashio, Hidetora, 3,896,063.

Kast, Hellmut; and Dunkelmann, Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Lactones of the diazaxanthene series and dye precursors for copying processes. 3,896,128, Cl. 260-256.40F.

Kast, Philip J.: *See*—
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Kastner, Arnold. Apparatus for packaging cigarette tubes. 3,895,479, Cl. 53-148.000.

Kasuga, Masao: *See*—
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Katashiba, Yasutada: *See*—
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Kathawala, Faizulla G., to Sandoz, Inc. Substituted pyrazolyl phenylacetic acid derivatives. 3,896,143, Cl. 260-310.00D.

Kato, Hajime; and Hayashi, Takao, to Fuji Photo Film Co., Ltd. Recording sheet. 3,896,255, Cl. 428-411.000.

Kaufman, Burton; and Schneider, Bruce H., to General Computing Corporation. High speed microfilm searching system. 3,895,865, Cl. 353-26.000.

Kawakami, Akira, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor switching device. 3,896,476, Cl. 357-38.000.

Kawamoto, Kinji, to Matsushita Electric Industrial Co., Ltd. Sampling modulation system for an electronic musical instrument. 3,895,553, Cl. 84-1.240.

Kawamura, Chikayuki: *See*—
Isoya, Toshiro; Kakuta, Rinichi; and Kawamura, Chikayuki, 3,896,011.

Kawarada, Junji: *See*—
Endo, Kunio; Kawarada, Junji; Sueishi, Motoharu; Harada, Susumu; and Norimatsu, Hideaki, 3,895,611.

Kay, Edward Leo: *See*—
Wakefield, Lynn B.; Crane, Grant; and Kay, Edward Leo, 3,896,059.

Keck, Johannes; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. 4-(4′-amino-3′,5′-dichloro-phenyl)-3-tertiary butyl-oxazolidines. 3,896,141, Cl. 260-307.0FA.

Keeling, Robert Alan; and Priest, John Garrick, to Johnson, Matthey & Co. Limited. Self-adhesive transfers. 3,896,249, Cl. 428-202.000.

Keely, William Arthur; and Kreger, Merle Manford, Jr., to Bendix Corporation, The. Light activated sequential switching mechanism. 3,895,612, Cl. 123-32.0EA.

Kehr, Sharon: *See*—
Buckles, Richard G.; Hoff, Seymour; Kehr, Sharon; and Yum, Su Il, 3,895,631.

Kelcey, Raymond Robinson. Covering for recreational areas. 3,895,400, Cl. 4-172.110.

Keller, Albert G.: *See*—
Morrison, Howard J.; Keller, Albert G.; and Glass, Marvin I., 3,895,459.

Keller, Heinz-Jochen: *See*—
Forster, Friedrich; Barth, Erich; and Keller, Heinz-Jochen, 3,895,919.

Kellogg, Warren H. Means mounted on a bowstring tensioning device for releasably holding a bowstring. 3,895,621, Cl. 124-24.00R.

Kelly, Raymond E.; and Lovejoy, Richard E., to United States of America, Navy. Paired cable drag reduction with non-newtonian fluids. 3,895,595, Cl. 114-235.00F.

Kenna, Fenton L., Jr.: *See*—
Phillips, Carmen S.; Blanton, Albert G.; and Kenna, Fenton L., Jr., 3,895,573.

Kennecott Copper Corporation: *See*—
Ammann, Paul R., 3,896,210.

Kenner, George Wallace: *See*—
Hardy, Paul Martin; Kenner, George Wallace; Sheppard, Robert Charles; Morley, John Selwyn; and MacLeod, John Keith, 3,896,103.

Ker-Train Systems N.V.: *See*—
Kerr, John Hugh, 3,895,700.

Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung: *See*—
Forster, Siegfried; Hewing, Gunter; and Quell, Peter, 3,895,492.

Kerr, John Hugh, to Ker-Train Systems N.V. Worm/worm-wheel overrunning clutch. 3,895,700, Cl. 192-41.00R.

Kessinger, Orville E., Jr.: *See*—
Schmitt, James L.; Castle, Clarence L., Jr.; and Kessinger, Orville E., Jr., 3,895,703.

Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co.: *See*—
Stolzer, Paul, 3,895,723.

Key Chemicals, Inc.: *See*—
Carstens, Ronald A.; and Butcher, William J., 3,896,046.

Keyes, Melvin H., to Owens-Illinois, Inc. Electrochemical potentiometric method for selectively determining alkaline phosphatase content in aqueous fluids. 3,896,008, Cl. 204-1.00T.

Kheifets, Rafail Efimovich: *See*—
Anikanov, Nikolai Ivanovich; Baburin, Evgeny Arkadievich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Frumkin, Mikhail Evseevich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,566.
Anikanov, Nikolia Ivanovich; Grachev, Leonid Pavlovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,707.

Khoroneko, Nadezhda Serafimovna: *See*—
Levin, Solomon Isaakovich; Samonov, Valentin Terentievich; Tsygankin, Nikolai Ivanovich; and Khoroneko, Nadezhda Serafimovna, 3,895,706.

Kiehs, Karl: *See*—
Beutel, Peter; Adolphi, Heinrich; and Kiehs, Karl, 3,896,190.

Kijima, Shizumasa: *See*—
Sato, Kikumasa; Inoue, Seiichi; Kijima, Shizumasa; and Hamamura, Kimio, 3,896,153.

Kilbourn, Edward E., to Rohm and Haas Company. 3-Pyridylmethyl carbamate rodenticides. 3,896,134, Cl. 260-295.50C.

Killen, Charles W.; and Forward, Robert W., to General Motors Corporation. Instrument panel radio antenna. 3,896,448, Cl. 343-713.000.

Killinger, Karl H., to Singer Company, The. Thread cutting device. 3,895,591, Cl. 112-252.000.

Kimball, Everett L., to Ronson Corporation. Butane lighter assembly. 3,895,904, Cl. 431-143.000.

Kimura, Masatoshi: *See*—
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; Kimura, Masatoshi; and Saito, Mitsutaka, 3,896,067.

King, Arthur Shelley. Boat lift. 3,895,592, Cl. 114-45.000.

King, Randall N.: *See*—
Mitoff, Stephan P.; Powers, Robert W.; and King, Randall N., 3,896,019.

King, Robert E., Jr.; and Terkelsen, Bruce E., to United Aircraft Corporation. Integrated furnace method and apparatus for the continuous production of individual castings. 3,895,672, Cl. 164-60.000.

King, Toni B., to Raymond Lee Organization, Inc., The, a part interest. Projector and catcher with variable target opening. 3,895,800, Cl. 273-96.00R.

Kinoshita, Sadamu. Electric arc furnace for melting metals and metal melting method using such furnace. 3,896,257, Cl. 13-33.000.

Kinoshita, Tuyoshi: *See*—
Takahashi, Hidehiko; Suzuki, Yoshio; and Kinoshita, Tuyoshi, 3,896,127.

Kinsel, Robert Carl; and Magee, Robert Nick, to Cincinnati Milacron Inc. Feedback circuit for detecting the failure of a stepping motor to respond to the control circuit. 3,896,363, Cl. 318-685.000.

Kioritz Corporation: *See*—
Kobayashi, Torao; and Ninagawa, Chikato, 3,896,009.

Kipp, Dieter, to Robert Bosch G.m.b.H. Energization circuit for dynamo electric machines driving, or braking vehicle wheels. 3,896,350, Cl. 318-87.000.

Kirsop, Brian Heys: *See*—
Barrett, James; Kirsop, Brian Heys; and Palmer, Godfrey Henry Oliver, 3,896,001.

Kiryanov, Jury Ivanovich: *See*—
Lozenko, Valery Konstantinovich; Morozov, Vladimir Alexandrovich; Pavlikhin, Vladimir Serafimovich; Santalov, Anatoly Mikhailovich; Negodyaev, Leonid Nikolaevich; and Kiryanov, Jury Ivanovich, 3,896,349.

Kiser, Fred W., to Timesavers, Inc. Lumber dressing and dimensioning machine. 3,895,464, Cl. 51-137.000.

Kitajima, Nobuo: *See*—
Hanada, Hiroshi; and Kitajima, Nobuo, 3,895,943.

Kitaura, Mashio; Yata, Koutaro; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Digital indicator for cameras. 3,895,875, Cl. 356-226.000.

Klaxon: *See*—
Laurent, Philippe, 3,896,426.

Klingenberg, George R. No drip suck back units for glue or other liquids either separately installed with or incorporated into no drip suck back liquid applying and control apparatus. 3,895,748, Cl. 222-571.000.

Klingler, Karl-Heinz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Xanthines substituted in the 8-position. 3,896,119, Cl. 260-247.20A.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Joshi, Suryakant, 3,895,613.

Klopping, Hein L., to du Pont de Nemours, E. I., and Company. Fungicidal formulations of 2-benzimidazole-carbamic acid, alkyl esters. 3,896,230, Cl. 424-273.000.

Klotz, Helmut, to Bayer Aktiengesellschaft. Purification of mercury. 3,895,938, Cl. 75-101.00R.

Klug, Eugene D., to Hercules Incorporated. Derivatized ethyl cellulose. 3,896,107, Cl. 260-211.00R.

Klug, Eugene D., to Hercules Incorporated. Carboxyalkyl modified ethyl cellulose. 3,896,108, Cl. 260-231.00A.

Klyce, Thomas A., to Ranger Tool Co., Inc. Sausage casing breaker. 3,895,414, Cl. 17-1.00F.

Knock-N-Lok International, Inc.: *See*—
Solo, Alan J., 3,895,773.

Kobayashi, Torao; and Ninagawa, Chikato, to Kioritz Corporation. Aluminum alloy cylinder. 3,896,009, Cl. 204-26.000.

Koch, Christian, to Siemens Aktiengesellschaft. Gas turbine. 3,895,488, Cl. 60-39.460.

Koch, Paul E.: *See*—
Herold, Albert J.; Koch, Paul E.; and Adams, Richard C., 3,895,900.

Kodama, Koji, to Tokyo Shibaura Electric Company, Ltd. Protecting device for a semiconductor memory apparatus. 3,896,341, Cl. 317-33.00R.

Kodama, Yutaka: *See*—
Ishimaru, Toshiyasu; and Kodama, Yutaka, 3,896,118.

Kodashima, Tadashi: *See*—
Noda, Akira; Wakako, Atsuhiro; Kodashima, Tadashi; and Tanaka, Akio, 3,895,549.

Koehne, Anthony J.; and Baughan, Harry O., III, to Poly-Seal Corporation. Safety container. 3,895,730, Cl. 215-216.000.

Koenig, Karl-Heinz: *See*—
Hamprecht, Gerhard; Koenig, Karl-Heinz; and Fischer, Adolf, 3,896,155.

Koenig, Rainer H.: *See*—
Alliston, William H.; and Koenig, Rainer H., 3,896,041.

Kogyo Gijutsuin: *See*—
Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, 3,895,978.

Kohl, Karl. Yarn guides for warp knitting machines. 3,895,503, Cl. 66-86.00R.

Koishi, Hitoshi; and Ishida, Yoshihiro, to Tokyo Printing Ink Mfg. Co., Ltd. Vehicles for printing ink. 3,896,064, Cl. 260-24.000.

Kojima, Katsue: *See*—
Kubota, Tomio; Kojima, Katsue; and Ohta, Masafumi, 3,896,112.

Kojima, Makoto: *See*—
Noda, Yuzuru; Kojima, Makoto; Mazaki, Shiro; and Katashiba, Yasutada, 3,896,089.

Kokado, Naoyuki, to Tokyo Shibaura Electric Company Ltd. Fractional frequency dividers. 3,896,387, Cl. 328-39.000.

Kolb, Alfred Reeves, to Brown & Root, Inc. Method and apparatus for forming elongated batter piling in situ. 3,895,471, Cl. 52-726.000.

Kolb, William A.; and Sigh, Jack F., to United States Steel Corporation. Apparatus for and method of optimum burning of carbon monoxide in a converter. 3,895,784, Cl. 266-35.000.

Kolb, William A.; and Vignovich, Pete, to United States Steel Corporation. Method and apparatus for controlling the operation of a steel refining converter. 3,895,785, Cl. 266-35.000.

Komatsu, Tasaaki; and Arai, Shinichi, to Bridgestone Tire Company Limited. Apparatus for and method of applying a strip of elastic material to a tire bead. 3,895,986, Cl. 156-136.000.

Komine, Yoshio: *See*—
Takigawa, Tomoshi; and Komine, Yoshio, 3,896,465.

Komoda, Yasuo: *See*—
Kupchan, S. Morris; Komoda, Yasuo; Thomas, Gareth J.; and Court, William A., 3,896,111.

Konan Camera Research Institute: *See*—
Ikegami, Yoshizo, 3,896,263.

Kondo, Marekata; Fukuda, Seiwa; and Yamamoto, Toyohiko, to Mitsubishi Mining & Cement Company, Ltd. Process for burning cement clinker. 3,895,955, Cl. 106-100.000.

Kondoh, Teruo; and Nakatsuka, Koki, to Mitsubishi Denki Kabushiki Kaisha. Radar mounted on helicopter. 3,896,446, Cl. 343-705.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Sawano, Hiroshi, 3,895,858.

Kontes Glass Company: *See*—
Thoden, John, 3,895,758.

Kopec, Thomas J.; and Morstadt, Richard A., to GTE Automatic Electric Laboratories Incorporated. Ringing signal detector circuit. 3,896,270, Cl. 179-84.00L.

Koppers Company, Inc.: *See*—
Jonnet, Albert G., 3,895,448.

Korn, Hugo, to Motorola, Inc. Reel to reel cartridge tape player system. 3,895,765, Cl. 242-194.000.

Korn, Roland; Seyd, Gunter; and Paulsen, Uwe, to Siemens Aktiengesellschaft. Cleaning contaminated surfaces of nuclear power plants and recovery of removed surface particles. 3,895,465, Cl. 51-320.000.

Korpert, Heinz, to Jos. Schneider & Co. Control mechanism for varifocal objective. 3,896,466, Cl. 354-196.000.

Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; Kimura, Masatoshi; and Saito, Mitsutaka, to Toyo Soda Manufacturing Co., Ltd. Process for preparing polymer compositions having substantial adhesive properties. 3,896,067, Cl. 260-28.5AV.

Kosaka, Yujiro; Kuroki, Hitoshi; Echida, Nobuhiro; Otomo, Kanji; and Uemura, Masaru, to Toyo Soda Manufacturing Co., Ltd. Hot melt composition having improved softening temperature. 3,896,069, Cl. 260-28.5AV.

Koskiewicz, Emily, to Lawrence Peska Associates, Inc., a part interest. Global sphere yo-yo device. 3,895,457, Cl. 46-61.000.

Kotone, Akira; Hiri, Yoshiyuki; and Masada, Tadashi, to Sakai Chemical Industry Company, Limited. Novel pyrrolidone derivatives and manufacturing the same. 3,896,149, Cl. 260-326.250.

Kottmeier, Robert Roy, to Canadian Liquid Air Ltd., Air Liquide Canada Ltee. Heating process and apparatus using oxygen. 3,895,906, Cl. 432-22.000.

Kowalsky, Stanley J. Alarm system operated by ambient conditions. 3,896,422, Cl. 340-227.00R.

Koyama, Akira, to Yamada Dobby Co., Ltd. Card reverting and racing apparatus in a dobby machine. 3,895,653, Cl. 139-1.00E.

Koyama, Akira, to Yamada Dobby Co., Ltd. Paper card reading apparatus in a dobby machine. 3,895,658, Cl. 139-331.000.

Kozhevnikov, Sergei Nikolaevich; Tkachenko, Arkady Semenovich; and Fedorovsky, Eduard Fedorovich. Tube cold rolling mill. 3,895,510, Cl. 72-214.000.

Kozlowski, Dennis C.: *See*—
Mackey, Larry C.; and Kozlowski, Dennis C., 3,896,411.

Kraemer, Stefan; Seidl, Alois; and Reidl, Hans-Joachim, deceased (by Reidl, Herta Emilie, legal representative), to Wasag Chemie. Explosive of reduced capacity containing siliceous foam particles. 3,895,979, Cl. 149-2.000.

Kramell, Hans P.; and Hansen, Richard C., to Xerox Corporation. Bottom sheet feeder using separation belt and retard pad. 3,895,791, Cl. 271-35.000.

Kratzer, Otto; and Bipp, Hansjoerg, to BASF Aktiengesellschaft. Production of dicarboxylic acid diesters. 3,896,159, Cl. 260-475.00B.

Krauss-Maffei Aktiengesellschaft: *See*—
Schwarzler, Peter, 3,895,585.

Kreger, Merle Manford, Jr.: *See*—
Keely, William Arthur; and Kreger, Merle Manford, Jr., 3,895,612.

Kreider, Robert W., to DeSoto, Inc. High opacity resin coatings. 3,896,138, Cl. 252-301.20R.

Kremennoi, Grigory Grigorievich: *See*—
Feoktistov, Evgeny Ilich; Chechulin, Evgeny Arkadievich; Zonov, Nikolai Semenovich; Prozorov, Leonid Kronidovich; Poskryakov, Jury Maximovich; Kremennoi, Grigory Grigorievich; and Goryachy, Vladimir Mikhailovich, 3,896,281.

Krenzer, Robert W.: *See*—
Brooks, John A.; and Krenzer, Robert W., 3,895,939.

Kreutze, Gerhard: *See*—
Soehring, Gerhard; Kreutze, Gerhard; and Obstfelder, Guenther, 3,896,491.

Krol, John E.: *See*—
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Kron, Lester E.: *See*—
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Krone, Donald R.: *See*—
Buchanan, George E.; Krone, Donald R.; Krone, Russell R.; and Noyes, James E., 3,895,738.

Krone, Russell R.: *See*—
Buchanan, George E.; Krone, Donald R.; Krone, Russell R.; and Noyes, James E., 3,895,738.

Krueger, Wallace F. Reversible cooking unit. 3,895,622, Cl. 126-38.000.

Kubodera, Seiiti: *See*—
Shiba, Keisuke; Kubodera, Seiiti; Ohi, Reiichi; Shishido, Tadao; Yamamoto, Nobuo; and Sakai, Takeo, 3,895,948.

Kubota, Tomio; Kojima, Katsue; and Ohta, Masafumi, to Kabushiki Kaisha Ricoh. Bisbenzopyran and bisbenzopyrylium adducts. 3,896,112, Cl. 260-240.00D.

Kubotera, Kikuo; Mizuki, Eiichi; and Fujiwara, Tadahiro, to Fuji Photo Film Co., Ltd. Process for producing a lithographic printing plate. 3,895,946, Cl. 96-33.000.

Kudashov, Vasily Yakovlevich: *See*—
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; and Zimnyakov, Alexandr Vasilievich, 3,895,446.

Kuehnhanss, Gerhard O.: *See*—
Lindsay, Kenneth L.; Kuehnhanss, Gerhard O.; and Tuvell, Melvin E., 3,896,057.

Kulka, William A.: *See*—
Ariyan, Zaven S.; and Kulka, William A., 3,896,223.

Kumagai, Yoshiko: *See*—
Yoshida, Akitoshi; Asahara, Koichi; Yanagida, Koichiro; Maruyama, Tadanobu; Takatsu, Ikue; and Kumagai, Yoshiko, 3,895,956.

Kunze, Lothar: *See*—
Budecker, Ludwig; and Kunze, Lothar, 3,895,891.

Kupchan, S. Morris; Komoda, Yasuo; Thomas, Gareth J.; and Court, William A., to Research Corporation. Ansa Macrolides. 3,896,111, Cl. 260-239.30T.

Kupfert, Bernard F.; and Bailey, Gerald J., to Parker-Hannifin Corporation. Rotary shaft seal. 3,895,814, Cl. 277-134.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Toyoda, Yasushi; and Kashio, Hidetora, 3,896,063.

Kuroki, Hitoshi: *See*—
Kosaka, Yujiro; Kuroki, Hitoshi, Echida, Nobuhiro; Otomo, Kanji; and Uemura, Masaru, 3,896,069.

Kurosaka, Akira: *See*—
Nakao, Hisaji; Kurosaka, Akira; Otani, Katsunori; Tsuzuki, Sadaaki; and Honda, Yuzo, 3,895,427.

Kuschel, Hans: *See*—
Gawlick, Heinz; Kuschel, Hans; Marondel, Gunther; Siegelin, Werner; and Spranger, Wolfgang, 3,895,579.

Kushner, Ben: *See*—
Jureit, John C.; Kushner, Ben; and Castillo, Adolfo, 3,895,708.

Kwatonowski, Frank, to Johns-Manville Corporation. Spacer grommet and method of manufacture thereof. 3,895,409, Cl. 16-2.000.

Lagofun, Guy Jean, to Etat Francais. Explosive type severing device for cables, rods and the like. 3,895,552, Cl. 83-580.000.

Lakah, Lucien: *See—*
Joullie, Maurice; Lakah, Lucien; Maillard, Gabriel F.; and Muller, Pierre, 3,896,121.

Lal Kaul, Bansi, to Sandoz Ltd. Novel metallized heterocyclic derivatives. 3,896,113, Cl. 260-240.00G.

Lamamatsch, Hans: *See—*
Diepers, Heinrich; Jablonski, Karl-Heinz; and Lamamatsch, Hans, 3,895,432.

Lambert, Robert R. Apparatus for sensing volumetric rate of air flow. 3,895,531, Cl. 73-212.000.

Laminite Plastics Mfg. Corporation: *See—*
Bales, Emmett R.; and Estes, Clarence F., Jr., 3,895,670.

Lamparsky, Dietmar: *See—*
Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,896,175.

Landucci, Dennis P., to Minnesota Mining and Manufacturing Company. Outerwear fabric treatment. 3,896,251, Cl. 428-290.000.

Lane, Thomas A.: *See—*
Lang, Theo O.; and Lane, Thomas A., 3,895,983.

Lang Davis Industries, Inc.: *See—*
Lang, Thomas J.; Lang, Kenneth G.; Lang, Joseph A.; and Davis, Robert L., 3,895,683.

Lang, Joseph A.: *See—*
Lang, Thomas J.; Lang, Kenneth G.; Lang, Joseph A.; and Davis, Robert L., 3,895,683.

Lang, Kenneth G.: *See—*
Lang, Thomas J.; Lang, Kenneth G.; Lang, Joseph A.; and Davis, Robert L., 3,895,683.

Lang, Theo O.; and Lane, Thomas A., to Foster Grant Co., Inc. Process of fabricating a plastic net laminate material. 3,895,983, Cl. 156-79.000.

Lang, Thomas J.; Lang, Kenneth G.; Lang, Joseph A.; and Davis, Robert L., to Lang Davis Industries, Inc. Lateral acceleration sensing system. 3,895,683, Cl. 180-103.000.

Lange, K. Robert; Stern, Arthur M.; Gasner, Lawrence L.; and Hsu, Yuan Tsun, to Betz Laboratories, Inc. Beneficiation of lignin solutions and pulp mill wastes. 3,895,996, Cl. 162-16.000.

Lange, Ronald E.; Diethelm, Matthew A.; and Ishmael, Phillip C., to Honeywell Information Systems Inc. Cache memory store in a processor of a data processing system. 3,896,419, Cl. 340-172.500.

Langford, Orville L. Hand cutting tool. 3,895,442, Cl. 30-299.000.

Langlois, Christian Charles, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Tool-carriers with retractable tool-bits. 3,895,881, Cl. 408-156.000.

LaPlante, Harold J., to Minnesota Mining and Manufacturing Company. Data processing form. 3,896,295, Cl. 235-61.12N.

Larralde, Edward; and Robinson, Glen, to Vetco Offshore Industries, Inc. Cylinder and piston apparatus. 3,895,780, Cl. 254-172.000.

Larry, John Robert, to du Pont de Nemours, E. I., and Company. High adhesion metallizations. 3,896,054, Cl. 106-1.000.

Larsson, Bjorn E.; and Le Sota, Stanley, to Rohm and Haas Company. Emulsion copolymers of acrolein and their use in treating leather. 3,896,085, Cl. 260-67.0UA.

Lasher, Edward A., to Whittaker Corporation. Unsaturated polyester resin, coatings made therefrom and method of making same. 3,896,098, Cl. 260-872.000.

Laskey, Donald M. Accessory mounting apparatus for camera. 3,896,463, Cl. 354-122.000.

Laudon, Monique: *See—*
Bugaut, Andree; and Laudon, Monique, 3,896,117.

Laumont, Roger, to Hydroperfect-International H P I. Geared hydraulic apparatus. 3,895,890, Cl. 418-132.000.

Laurens, Roger, to Pipeline Equipment Company E.P.C.O. Valve with a spherical closure-member. 3,895,776, Cl. 251-148.000.

Laurent, Philippe, to Klaxon. Theft alarm employing self-adjusting disturbance switch. 3,896,426, Cl. 340-261.000.

Laurer, Peter Rudolf: *See—*
Broecker, Franz Josef; Heners, Juergen; Marosi, Laszlo; Schwarzmann, Matthias; and Laurer, Peter Rudolf, 3,896,053.

Lawrence Brothers, Inc.: *See—*
Johnson, Larry K., 3,895,412.

Lawrence Peska Associates, Inc.: *See—*
Burns, John J., 3,895,806.
Fegan, Joseph J., 3,895,750.
Koskiewicz, Emily, 3,895,457.
McCarthy, Carol S., 3,895,755.
Moy, Henry, 3,895,507.
Olevsky, Walter, 3,895,597.
Sauve, Delsford B., 3,895,548.
Shockley, Charles Glenn, 3,895,809.

Lazarev, Vadim Georgievich: *See—*
Efimov, Ivan Ivanovich; Lifshits, Mikhail Lvovich; Nikiforov, Dmitry Dmitrievich; Ivanov, Viktor Pavlovich; Linetsky, Lev Efimovich; Lazarev, Vadim Georgievich; and Brenin, Alexandr Ivanovich, 3,896,339.

Le Bouchage Mecanique: *See—*
Coursaut, Henri, 3,895,731.

Le Presentroir Seiller: *See—*
Seiller, Pierre Francois Xavier, 3,895,718.

Lebert, Herbert A. Vacuum actuated vehicle safety device. 3,895,841, Cl. 297-384.000.

Leblanc, Jean, to Societe Industrielle Generale de Mecanique Applique S.I.G.M.A. Device for correcting the delivery of a distributing injection pump and pump equipped therewith. 3,895,886, Cl. 417-284.000.

Le Blanc, Oliver H., Jr., to General Electric Company. Carbon dioxide and pH sensor. 3,896,020, Cl. 204-195.00M.

Leblond, Jean R., to Uniroyal (France). Tire Testing Machine. 3,895,518, Cl. 73-146.000.

Lech, Leon: *See—*
Dubeck, Michael; and Lech, Leon, 3,896,208.

Le Cornu-Rickard, John Fyfe: *See—*
Summers, Leo Ewart Arthur; Le Cornu-Rickard, John Fyfe; and Underhill, David Sidney, 3,895,436.

Lederer, Seymour J., to Merck & Co., Inc. Method for protecting aqueous coating systems from bacterial attack with benzyl bromo acetate. 3,896,136, Cl. 260-29.60R.

Lee, Elizabeth Anna. Game apparatus. 3,895,804, Cl. 273-131.0AD.

Leesona Corporation: *See—*
Anderson, Ernest David, 3,895,560.

Lefebvre, Pierre. Discardable lighter. 3,895,903, Cl. 431-143.000.

Leidy, Lester R., Jr., to Honeywell Inc. Fuse ejector. 3,896,408, Cl. 337-211.000.

Leight, Howard S. Ear protector. 3,895,627, Cl. 128-152.000.

Leingang, Charles J. Resilient mounting. 3,895,408, Cl. 16-2.000.

Leingartner, Josef: *See—*
Marker, Harald; and Leingartner, Josef, 3,895,895.

Lemberg, Seymour, to International Flavors & Fragrances Inc. Cyclododecadieneols and their preparation. 3,896,180, Cl. 260-617.00M.

Lemelson, Jerome H. Toy mechanism. 3,895,458, Cl. 46-202.000.

Leney, Thomas F.: *See—*
Pelton, Frank M.; Bruder, Joseph A.; and Leney, Thomas F., 3,896,391.

Lenz, Johann: *See—*
Brunnmueller, Friedrich; Henkel, Helmut; and Lenz, Johann, 3,896,087.

Leonard, Fred; and Brandes, George. Underwater adhesive. 3,896,077, Cl. 260-42.480.

Leonard, Verna M. Chord pattern analyser. 3,895,556, Cl. 84-471.000.

Lerner, Bernard J. Method for treating a gas. 3,895,926, Cl. 55-84.000.

Leroy, Jean, to Metallurgie Hoboken-Overpelt. Continuous casting of metal rods and bars. 3,895,428, Cl. 29-527.600.

Le Sota, Stanley: *See—*
Larsson, Bjorn E.; and Le Sota, Stanley, 3,896,085.

Lester, John M.; Crist, Philip W.; and O'Toole, Charles E., to Sperry Rand Corporation. Multi-spot radar jamming system. 3,896,439, Cl. 343-18.00E.

Levin, Solomon Isaakovich; Samonov, Valentin Terentievich; Tsygankin, Nikolai Ivanovich; and Khoroneko, Nadezhda Serafimovna. Arrangement for feeding the bulbs of electric vacuum devices. 3,895,706, Cl. 198-127.00R.

Lewinstein, Evalina: *See—*
Fishman, Jack, 3,896,226.

Lewis, Philip S., Jr.; Agee, William A.; Bullock, Jonathan S., IV; and Condon, James B., to United States of America, Energy Research and Development Administration. Process for electroslag refining of uranium and uranium alloys. 3,895,935, Cl. 75-10.00R.

Lewis, Richard W., to Boeing Company, The. Heading sensor with compensation windings. 3,895,869, Cl. 335-296.000.

Ley, Kurt: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, 3,896,222.

Liang, Robert Ng: *See—*
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Liberg, Lars-Olof, to Jonkopings Mekaniska Werkstads AB. Emptying system for fluid tanks. 3,895,885, Cl. 417-54.000.

Lien, Erling L., to Varian Associates. Permanent magnet beam focus structure for linear beam tubes. 3,896,329, Cl. 315-3.500.

Liesegang, Gerhard, to Lisega Rohrleitungszubehor GmbH. Suspension device particularly for pipes. 3,895,788, Cl. 267-70.000.

Lifshits, Mikhail Lvovich: *See—*
Efimov, Ivan Ivanovich; Lifshits, Mikhail Lvovich; Nikiforov, Dmitry Dmitrievich; Ivanov, Viktor Pavlovich; Linetsky, Lev Efimovich; Lazarev, Vadim Georgievich; and Brenin, Alexandr Ivanovich, 3,896,339.

Lin, Paul, to Amalgamated Wireless (Australasia) Limited. Blending function and blending function generator. 3,896,444, Cl. 343-106.00D.

Lincoln, Frank H., Jr.: *See—*
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Lindberg, John E. Fire and overheat detection system. 3,896,423, Cl. 340-229.000.

Linder, Jerome; and Weil, Edward D., to Hooker Chemicals & Plastics Corporation. Dinitrophenylenediamines as herbicides. 3,895,934, Cl. 71-121.000.

Lindmayer, Joseph, to Communications Satellite Corporation. Method for the post-alloy diffusion of impurities into a semiconductor. 3,895,975, Cl. 148-178.000.

Lindsay, Kenneth L.; Kuehnhanss, Gerhard O.; and Tuvell, Melvin E., to Ethyl Corporation. Composite olefin sulfonate. 3,896,057, Cl. 252-555.000.

Linetsky, Lev Efimovich: *See—*
Efimov, Ivan Ivanovich; Lifshits, Mikhail Lvovich; Nikiforov, Dmitry Dmitrievich; Ivanov, Viktor Pavlovich; Linetsky, Lev

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Lo, Allen Wah; and Nims, Jerry Curtis, to Dimensional Development Corporation. Three dimensional pictures and method of composing them. 3,895,867, Cl. 355-77.000.
Lo, Jyh-Shuey: *See*—
Coleman, James H.; and Lo, Jyh-Shuey, 3,896,354.
Lockwood, Robert J.; Reymore, Harold E., Jr.; and Thompson, Edward J., to Upjohn Company, The. Cocatalyst system for trimerizing polyisocyanates. 3,896,052, Cl. 252-431.00C.
Loderer, Peter, to Siemens Aktiengesellschaft. Circuit for supplying a dc load from an ac source through a rectifier. 3,896,348, Cl. 318-227.000.
Lodige, Fritz: *See*—
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Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; Schluter, Wilhelm; and Beckschulte, Heinrich, to Lodige, Wilhelm; Lodige, Fritz; and Lucke, Josef. Apparatus for applying glue to wood shavings, fibers and similar cellulose containing substances. 3,895,781, Cl. 259-25.000.
Loe, James M. Laminar indicating target. 3,895,803, Cl. 273-102.00R.
Loev, Bernard, to SmithKline Corporation. 1-Dialkylaminoalkoxy-5,5-diphenyl-2-pyrrolidinone compounds. 3,896,148, Cl. 260-326.5FL.
Loev, Bernard: *See*—
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Lombardo, Anthony. Automatic bagging apparatus. 3,895,480, Cl. 53-256.000.
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Lone Star Industries, Inc.: *See*—
Snyder, Francis Henry, 3,895,760.
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Long, Robert A.: *See*—
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Longhenry, David K.: *See*—
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Longley, John William, to BBA Group Limited. Friction materials. 3,896,075, Cl. 260-38.000.
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Loyd, Robert W., Jr.; and Lombaerde, Charles, to Curtiss-Wright Corporation. Liquid cooling system for rotary internal combustion engine. 3,895,889, Cl. 418-83.000.
Lozenko, Valery Konstantinovich; Morozov, Vladimir Alexandrovich; Pavlikhin, Vladimir Serafimovich; Santalov, Anatoly Mikhailovich; Negodyaev, Leonid Nikolaevich; and Kiryanov, Jury Ivanovich. Electric drive for motors interconnected to form a ring circuit. 3,896,349, Cl. 318-85.000.
Lubbock, Frederick John: *See*—
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Ma, John, to Zenith Radio Corporation. Touch-tuning system for a television receiver. 3,896,403, Cl. 334-15.000.
Mabru, Marcel, to Saint-Gobain Industries. Method of processing raw materials for the manufacture of glass. 3,896,201, Cl. 264-118.000.
Mabuchi, Shunsuke; Tsuzuki, Kenji; Matsunaga, Hideaki; Shimizu, Sadami; and Sumita, Makoto, to Toyo Soda Manufacturing Co., Ltd. Method of reactivation of raney nickel. 3,896,051, Cl. 252-412.000.
MacDougall, John D.; and Manchester, Kenneth E., to Sprague Electric Company. Method of making insulated gate field effect transistor with controlled threshold voltage. 3,895,966, Cl. 148-1.500.
Mackey, Larry C.; and Kozlowski, Dennis C., to Westinghouse Electric Corporation. Reverberation condition adaptive sonar receiving system and method. 3,896,411, Cl. 340-3.00R.
MacLean, John P.; Bunn, Dorrance P.; and Mager, Adolph S., to Texaco Inc. Methods and apparatus for forming a dense phase catalyst transfer system. 3,896,026, Cl. 209-250.000.
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Madison-Kipp Corporation: *See*—
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Madlem, John R. Conduit adapter. 3,895,830, Cl. 285-27.000.
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MacLean, John P.; Bunn, Dorrance P.; and Mager, Adolph S., 3,896,026.
Mago, Blake F.; and West, Charles W., to Union Carbide Corporation. Nitro-substituted aromatic acid corrosion inhibitors for alkanolamine gas treating system. 3,896,044, Cl. 252-192.000.
Mahlandt, Lavern N.; Smith, John R.; Elliott, Floyd R.; and Greene, Larry D. Physical therapy machine. 3,895,623, Cl. 128-25.00R.
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Joullie, Maurice; Lakah, Lucien; Maillard, Gabriel F.; and Muller, Pierre, 3,896,121.
Maillet, Joseph. Tape activated keyboard-type instruments. 3,895,554, Cl. 84-115.000.
Majkrzak, Charles P., to International Telephone and Telegraph Corporation. Erection and retraction mechanism for a foldable antenna and its mast. 3,896,447, Cl. 343-709.000.
Makay, Nicolas, to F. G. Kretschmer & Co. Coated lead azide compositions sensitive to flames but insensitive to friction. 3,895,980, Cl. 149-8.000.
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Manson, Charles D., Jr., to Halliburton Company. Releasable pipe connector. 3,895,829, Cl. 285-3.000.

Manthey, Willi; and Deiwick, Horst, to BWG-Bergwerk-und Walzwerk Machinenbau G.m.b.H. Apparatus and method for cooling metal slabs with a unitary structure for depositing and grasping the slabs. 3,895,498, Cl. 62-64.000.

Manz, August Frederick, to Union Carbide Corporation. Variable transformer. 3,896,370, Cl. 323-43.50R.

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Mardla, Ilmar: *See—*
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Maringer, Robert E.; and Mobley, Carroll E., Jr., to Battelle Development Corporation. Centrifugal method of forming filaments from an unconfined source of molten material. 3,896,203, Cl. 264-165.000.

Marker, Harald; and Leingartner, Josef, to Dorst-Keramikmaschinen-Bau Inh. Otto Dorst u. Dipl.-Ing. Walter Schlegel. Device for transferring pressings to be sintered from a press producing them from powder materials, to a sintering support. 3,895,895, Cl. 425-78.000.

Marondel, Gunther: *See—*
Gawlick, Heinz; Kuschel, Hans; Marondel, Gunther; Siegelin, Werner; and Spranger, Wolfgang, 3,895,579.

Marosi, Laszlo: *See—*
Broecker, Franz Josef; Heners, Juergen; Marosi, Laszlo; Schwarzmann, Matthias; and Laurer, Peter Rudolf, 3,896,053.

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Martin, Donald Theodore: *See—*
Beaver, Guy Daniel; Young, Robert Cleland; and Martin, Donald Theodore, 3,896,206.

Martin, Frank T. Carburetor idle control means. 3,896,194, Cl. 261-41.00D.

Maruyama, Tadanobu: *See—*
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Masco Corporation: *See—*
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Masero, Kenneth J.; and Wise, David L., to Vaportech Corporation. Apparatus for treating cellulosic-containing articles to render them crease resistant. 3,895,447, Cl. 34-48.000.

Mason, Paul B.: *See—*
Stella, Joseph A.; Burke, Edward F., Jr.; and Mason, Paul B., 3,895,862.

Mather, Richard E., to Teledyne, Inc. Portable radiographic film processing apparatus. 3,896,469, Cl. 354-304.000.

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Matthews, Benjamin H.; Rhine, Jules W.; and Nangia, Suresh K., to Lucerne Products Inc. Rotary control. 3,896,410, Cl. 338-48.000.

Matumoto, Soziro: *See—*
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Maughlin, Richard K.; and Dexter, John B., to United States of America, Navy. Quick attachable tow cable adapter for A-7 airplanes. 3,895,767, Cl. 244-3.000.

Maximovich, Michael J., to PPG Industries, Inc. Process for preparing polycarbonates. 3,896,090, Cl. 260-77.50D.

May, Michael; and English, Melvin M., to May, Michael; and English, Melvin M. Hall effect position coded card detector. 3,896,292, Cl. 235-61.11D.

Mayer, Manfred, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Movable bobbin transport apparatus. 3,895,725, Cl. 214-41.000.

Maynard, Ralph D., Jr.; and Lirette, Douglas E., to Door Controls Incorporated. Door coordinator assembly. 3,895,461, Cl. 49-367.000.

Mayor, Yoland Pierre Paul; and Tord, Pierre Francois, to Harle & Lechopiez. Purification of iron oxides. 3,896,211, Cl. 423-138.000.

Mazaki, Shiro: *See—*
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McArthur, Billy W., to Sperry-Sun Well Surveying Company. Method and apparatus for measuring pressure related parameters in a borehole. 3,895,527, Cl. 73-151.000.

McCarthy, Carol S., to Lawrence Peska Associates, Inc., a part interest. Tamper proof envelope. 3,895,755, Cl. 229-83.000.

McCaully, Ronald J., to American Home Products Corporation. Intermediates for the preparation of 1,3-dihydro-2H-1, -benzodiazepin-2-ones. 3,896,170, Cl. 260-562.00P.

McCready, Newton W.: *See—*
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McCulloch, Paul L.; and Heinrich, Burton O. Method of making finished steel castings. 3,895,968, Cl. 148-2.000.

McDaniel, John E.: *See—*
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McDonnell Douglas Corporation: *See—*
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McFadden, Francis J.: *See—*
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McFarland, James W.; and Howes, Harold L., Jr., to Pfizer Inc. 1-(3-Hydroxystyryl pyridinium salts and their derivatives as whipworm control agents. 3,896,227, Cl. 424-263.000.

McGowan, H. Christopher; Male, Joseph A.; and McLaren, Malcolm G., to Exxon Research & Engineering Co. Process for the formation of beta alumina-type ceramics. 3,895,963, Cl. 136-153.000.

McGregor, Donald T. Slack compensator for brake systems. 3,895,538, Cl. 74-518.000.

McIntosh, Glen E.; and Loudon, John D., to Cryenco. Wet shield for a cryogenic vessel. 3,895,497, Cl. 62-45.000.

McIntosh, Robert H.; and Hull, Ezekiel H., to Anthony B. Askew. Additive for plastic materials. 3,896,101, Cl. 260-93.700.

McKairnes, Bernard J.: *See—*
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McKie, James E., Jr.: *See—*
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McKinely, Wayne A.; and Sarantakis, Dimitrois, to American Home Products Corporation. p-Glu-His-Trp-Ser-Tyr-D-Lys-Leu-Arg-Pro-Gly-$NH_2$ and intermediates. 3,896,104, Cl. 260-112.500.

McLaren, John Vincent: *See—*
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McLaren, Malcolm G.: *See—*
McGowan, H. Christopher; Male, Joseph A.; and McLaren, Malcolm G., 3,895,963.

McLaughlin, Joseph K., Jr.; and Courtright, Dennis R., to Hydroacoustics, Incorporated. Acoustic impulse generator. 3,895,687, Cl. 181-120.000.

McNay Equipment Company, Inc.: *See—*
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McRae, Wayne A., to Ionics, Incorporated. Method and apparatus for separating weakly ionizable substances from fluids containing the same. 3,896,015, Cl. 204-180.00P.

Mead, Ralph T., to Wilson Greatbatch Ltd. Solid state battery and method of making the same. 3,895,962, Cl. 136-83.00R.

Megatech Corporation: *See—*
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Megnin, Jean-Claude: *See—*
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Mehalchick, Emil J.; Cleveland, Joseph J.; Long, Robert A.; Schulze, Harry O.; and Marshall, Paul K., to GTE Sylvania Incorporated. Catalyst composition. 3,896,048, Cl. 252-455.00R.

Mehta, Povindar K., to University of California, The Regents of the. Admixtures for reducing slump loss in hydraulic cement concretes. 3,895,953, Cl. 106-88.000.

Meinhardt, Gunter: *See—*
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Meitinger, Heinz: *See—*
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Melton, Max Ray, to M. M. S., Inc. Sewer line blow-out plug. 3,895,466, Cl. 52-169.000.

Mengeringhausen, Max; Quenzel, Hermann; Gehrig, Reinhold; and Spanheimer, Willi, to Mero AG. Rotatable quick-acting axial pressure absorbing chuck for a circular welding machine. 3,895,789, Cl. 269-49.000.

Merbler, Rudolph. Roller skate wheels. 3,895,844, Cl. 301-5.700.

Merck & Co., Inc.: *See—*
Christy, Marcia Elizabeth, 3,896,237.
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Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Method of inhibiting algae employing nitrogen derivatives of halogenated biphenyls. 3,895,932, Cl. 71-67.000.

Mero AG: *See—*
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Merz, Christof. Base platform sport and gymnastic appliance with selectively connectible additional components. 3,895,795, Cl. 272-57.00J.

Metallgesellschaft Aktiengesellschaft: *See—*
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Metallurgie Hoboken-Overpelt: *See—*
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Metzger, Karl Georg: *See—*
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Metzger, Paul T.; and Mitchell, Wayne D., to Sybron Corporation. Adjustment mechanism. 3,895,543, Cl. 74-89.150.

Meyer, Jurgen; and Waller, Siegfried, to Siemens Aktiengesellschaft. Method and apparatus for automatic forward feed programmed control of a machine tool. 3,896,360, Cl. 318-571.000.

Meyer, Raymond Alan: *See—*
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Meyers, Cal Yale; and Malte, Ashok M., to Southern Illinois University Foundation. 3-Dihalomethyl-1-carboxy-1,2,2-trimethylcyclopentane. 3,896,164, Cl. 260-514.00J.

Micagil A.G.: *See—*
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Michaelis, David E., to Plastics Development Corporation of America. Method for making simulated wood panel. 3,896,199, Cl. 264-46.500.

Micheli, Adolph L.; and Dungan, Dennis F., to General Motors Corporation. Liquid level sensor for corrosive baths. 3,896,409, Cl. 338-28.000.

Microsystems International Limited: *See—*
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Mikami, Masao. Rotary automatic welder. 3,895,993, Cl. 156-582.000.

Mikazuki, Hideaki: *See—*
Nukui, Shigeru; and Mikazuki, Hideaki, 3,896,314.

Mikhailov, Alfa Ivanovich: *See—*
Bolshakov, Alexandr Ivanovich; Mikhailov, Alfa Ivanovich; Barkalov, Igor Mstislavovich; and Goldansky, Vitaly Iosifovich, 3,896,084.

Miles, William Walter James, to Bowthorpe Hellermann Limited. Lightning arresters and surge diverters. 3,896,352, Cl. 317-68.000.

Miller, Edward M., to Industrial Clean Air, Inc. Air modulating fume system. 3,895,569, Cl. 98-115.00R.

Miller, Ervin W., to Banner Metals Division Intercole Automation, Inc. Heavy duty shipping tray. 3,895,588, Cl. 108-51.000.

Miller, Everett R., to Owens-Corning Fiberglas Corporation. Method of making inlaid resins. 3,895,988, Cl. 156-245.000.

Miller, George T., to Hooker Chemicals & Plastics Corporation. Flameproofing of fabrics. 3,896,250, Cl. 428-272.000.

Miller, Henry F., to Uniroyal, Inc. Method of adjusting the sensitivity of a weighing mat. 3,895,421, Cl. 29-25.420.

Miller, Lowell C.: *See—*
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Miller, Paul: *See—*
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Miller, Ray A.: *See—*
Vetter, Ronald F.; Miller, Ray A.; Panella, Edward A.; and Rosolanka, James J., 3,895,515.

Miller, Russell C., to J. M. Eltzroth and Associates Inc. Composition and process for inhibiting corrosion of non-ferrous metal surfaced articles and providing surface for synthetic resin coating compositions. 3,895,969, Cl. 148-6.200.

Millmaster Onyx Corporation: *See—*
Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., 3,895,932.

Millonzi, Richard Phillip: *See—*
Bergfjord, John Alf; Radler, Richard William; and Millonzi, Richard Phillip, 3,896,184.

Mills, David G., to Beloit Corporation. Removable muffler unit for granulator apparatus or the like. 3,895,761, Cl. 241-301.000.

Minister of Aviation, in Her Majesty's Government of the United Kingdom of Great Britain & Northern Ireland: *See—*
Johnson, Gerald Frederic, 3,896,436.

Minnesota Mining and Manufacturing Company: *See—*
Landucci, Dennis P., 3,896,251.
LaPlante, Harold J., 3,896,295.
Mitsch, Ronald A., 3,896,188.
Rice, David E., 3,896,158.
Schultz, William J.; and Smith, Samuel, 3,896,035.
Taylor, Allen L.; and McFadden, Francis J., 3,896,311.

Minolta Camera Kabushiki Kaisha: *See—*
Kitaura, Mashio; Yata, Koutaro; and Yamada, Seiji, 3,895,875.
Sahara, Masayoshi; and Tominaga, Sinji, 3,896,460.
Yamanishi, Akio; and Yamazaki, Yasuo, 3,896,457.
Yoshiyama, Ichiro; Tsujimoto, Kayoshi; and Ueda, Hiroshi, 3,896,472.

Minors, Christopher John. Electric welding apparatus. 3,896,286, Cl. 219-86.000.

Mita, Masazo; and Hashimoto, Masami, to Kabushiki Kaisha Komatsu Seisakusho. Double drum winch. 3,895,699, Cl. 192-4.00R.

Mitchell, Wayne D.: *See—*
Metzger, Paul T.; and Mitchell, Wayne D., 3,895,543.

Mitchell, William E., to Dunlop Holdings Limited. Pneumatic tire and wheel rim assembly. 3,895,667, Cl. 152-378.00R.

Mitoff, Stephan P.; Powers, Robert W.; and King, Randall N., to General Electric Company. Method of forming beta-alumina articles. 3,896,019, Cl. 204-181.000.

Mitsch, Ronald A., to Minnesota Mining and Manufacturing Company. N-cyanophosphorus imides. 3,896,188, Cl. 260-940.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Kawakami, Akira, 3,896,476.
Kondoh, Teruo; and Nakatsuka, Koki, 3,896,446.
Nakata, Josuke, 3,896,369.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Yonemitsu, Eiichi; Kamiyama, Seiichi; Kanada, Toshiaki; and Nagai, Norio, 3,896,185.

Mitsubishi Mining & Cement Company, Ltd.: *See—*
Kondo, Marekata; Fukuda, Seiwa; and Yamamoto, Toyohiko, 3,895,955.

Mitsui, Hiromitsu, to Kabushiki Kaisha Suwa Seikosha. Driving device for liquid crystal cell. 3,896,318, Cl. 307-304.000.

Miyahara, Hiromitsu: *See—*
Takahashi, Noriyuki; Miyahara, Hiromitsu; and Inoue, Hidehiko, 3,895,816.
Takahashi, Noriyuki; Miyahara, Hiromitsu; and Inoue, Hidehiko, 3,895,820.

Miyauchi, Toshiyuki, to Nissan Jidosha Kabushiki Kaisha. Shift point stabilizing hydraulic control circuit for automatic transmission. 3,895,542, Cl. 74-868.000.

Miyazawa, Yoshihide: *See—*
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Suzuka, Susumu, 3,896,116.

Mizuki, Eiichi: *See—*
Kubotera, Kikuo; Mizuki, Eiichi; and Fujiwara, Tadahiro, 3,895,946.

Mobil Oil Corporation: *See—*
Lucas, Paul Adrian, 3,895,989.
Nace, Donald M., 3,896,024.

Mobley, Carroll E., Jr.: *See—*
Maringer, Robert E.; and Mobley, Carroll E., Jr., 3,896,203.

Modern Faucet Mfg. Co.: *See—*
Ward, Irving A., 3,895,643.

Moffatt, E. Marston, to United Aircraft Corporation. High speed electric generator. 3,896,320, Cl. 310-64.000.

Molin, Nils Ludvig: *See—*
Ingestad, Nils Torsten; and Molin, Nils Ludvig, 3,896,003.

Moline, Robert Alan: *See—*
MacRae, Alfred Urquhart; Miller, Paul; Moline, Robert Alan; and Simpson, John, 3,895,965.

Monsanto Company: *See—*
Hudson, Joseph F., 3,895,897.
Mullins, Darrell Dexter, 3,896,162.

Montecatini Edison S.p.A.: *See—*
Fagherazzi, Giuliano; Ferrero, Francesco; and Accattino, Gianfranco, 3,896,216.
Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, 3,896,167.

Montren, John J.: *See—*
Brechling, George E.; and Montren, John J., 3,896,482.

Moore, Alvin Edward. Light-weight, durable, water-traversing vehicle. 3,895,593, Cl. 114-56.000.

Moore, Alvin Edward. Pipe-framed, water-traversing vehicle. 3,895,594, Cl. 114-81.000.

Moore, Donald G., to Red Arrow Products Company. Process for smoking comestible material. 3,896,242, Cl. 426-314.000.

Moore, Harrington. Golf ball marker. 3,895,797, Cl. 273-32.00A.

Moore, James E., to Waugh Control Corporation. Flowmeter compensating system. 3,895,529, Cl. 73-194.00M.

Moore, Joseph E., to Chevron Research Company. Hydrocarbyl sulfenylmercapto pyrimidines used as pesticides. 3,896,225, Cl. 424-251.000.

Moore, Teddy L.: *See—*
Cullen, Donald L.; and Moore, Teddy L., 3,895,870.

Moran, Gonzalo, to Comercial Super - Dix, S.A. Air treatment device. 3,895,928, Cl. 21-74.00R.

Morehouse, Edward Lewis, to Union Carbide Corporation. Polyether urethane foam. 3,896,062, Cl. 260-2.5AH.

Moretti, Roberto H.: *See—*
Malaspina, Alex; and Moretti, Roberto H., 3,896,241.

Morgan, George H.: *See—*
Graafsma, Richard S.; and Morgan, George H., 3,895,422.

Mori, Chiharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Quantized indication apparatus. 3,895,876, Cl. 356-226.000.

Morinaga Milk Industry Co., Ltd.: *See—*
Okada, Katsuto; Ishibashi, Akichika; and Watanabe, Hirotaka, 3,895,651.

Morley, John Selwyn: *See—*
Hardy, Paul Martin; Kenner, George Wallace; Sheppard, Robert Charles; Morley, John Selwyn; and MacLeod, John Keith, 3,896,103.

Morlock, Gerhard: *See—*
Haschke, Heinz; Morlock, Gerhard; and Felber, Wilfried, 3,896,086.

Morozov, Vladimir Alexandrovich: *See—*
Lozenko, Valery Konstantinovich; Morozov, Vladimir Alexandrovich; Pavlikhin, Vladimir Serafimovich; Santalov, Anatoly Mikhailovich; Negodyaev, Leonid Nikolaevich; and Kiryanov, Jury Ivanovich, 3,896,349.

Morris, Richard H., to Sperry Rand Corporation. Apparatus for generating precise crossover frequency of two independent equal bandwidth spectra. 3,896,437, Cl. 343-17.700.

Morrison, Howard J.; Keller, Albert G.; and Glass, Marvin I., to Marvin Glass & Associates. Propelled toy device and launcher therefor. 3,895,459, Cl. 46-202.000.

Morrissey, Richard T., to B. F. Goodrich Company, The. Halogenation of ethylene terpolymers in a water slurry. 3,896,095, Cl. 260-80.780.

Morse, Jeremy Painter, to International Nickel Company, Inc., The. Strong, high purity nickel. 3,895,942, Cl. 75-200.000.

Morstadt, Richard A.: *See—*
Kopec, Thomas J.; and Morstadt, Richard A., 3,896,270.

Motorola, Inc.: *See—*
Cave, David L.; and Davis, Walter R., 3,896,393.
Korn, Hugo, 3,895,765.
McDonald, James A., 3,896,399.

Motschmann, Siegfried: *See—*
Buschbaum, Edwin; Motschmann, Siegfried; and Strenge, Gert, 3,896,012.

Moy, Henry, to Lawrence Peska Associates, Inc., a part interest. Safety lock device for a stove. 3,895,507, Cl. 70-177.000.

Moyer, Norman E.; and Walker, Dennis E., to Hughes Aircraft Company. Segment decoder for numeric display. 3,896,429, Cl. 340-336.000.

Moyer, Robert D. Windmill structure. 3,895,882, Cl. 415-2.000.

Mueller Co.: *See—*
Ellis, Daniel A.; and Luckenbill, Lawrence F., 3,895,832.

Mueller, James H. High efficiency, thermal regeneration anti-pollution system. 3,895,918, Cl. 23-277.00C.

Muller, Fritz. Vehicle anti-skid device. 3,895,664, Cl. 152-225.000.

Muller, Jurgen, to Robert Bosch G.m.b.H. Apparatus for wet treatment of photographic materials or the like. 3,896,468, Cl. 354-299.000.

Muller, Pierre: *See—*
Joullie, Maurice; Lakah, Lucien; Maillard, Gabriel F.; and Muller, Pierre, 3,896,121.

Muller, Rolf: *See—*
Bechstein, Herbert; Jaenke, Hans-Jurgen; Muller, Rolf; Ritter, Ernst; Staudt, Heinrich; Tomasch, Helmut; and Urlberger, Alois, 3,895,537.
Rudert, Frithjof; Muller, Rolf; and Gornott, Dietmar, 3,896,489.

Mullins, Darrell Dexter, to Monsanto Company. Stable compositions and methods of inhibiting polymerization of unsaturated carboxylic acid esters. 3,896,162, Cl. 260-486.00R.

Multi-Contact A.G.: *See—*
Neidecker, Rudolf, 3,895,853.

Muntjanoff, John R., to Caterpillar Tractor Co. Grapple snubbing apparatus. 3,895,694, Cl. 188-83.000.

Murakami, Noboru, to Aisin Seiki Kabushiki Kaisha. Transmission control system. 3,895,547, Cl. 74-867.000.

Murawski, Stephen; and McKairnes, Bernard J. Freezer monitor thermal responsive switch with gravity actuated plunger contact retained by freezable liquid in open switch position. 3,896,278, Cl. 200-52.00R.

Murayama, Yukio: *See—*
Hara, Takao; and Murayama, Yukio, 3,896,265.

Murphy Chemical Company Limited, The: *See—*
Pianka, Max, 3,896,219.

Murphy, Preston V.: *See—*
Fraim, Freeman W.; and Murphy, Preston V., 3,896,274.

Mustee, Bernard E., to E. L. Mustee & Sons, Inc. Free-standing shower stalls. 3,895,398, Cl. 4-146.000.

Mylari, Banavara L., to Pfizer Inc. Preparation of 2 (aryl)-as-triazine-3,5(2H,4H)-diones. 3,896,124, Cl. 260-248.0AS.

Mylari, Banavara L.; and Brennan, Thomas M., to Pfizer Inc. Preparation of amino-diphenylsulfides. 3,896,172, Cl. 260-578.000.

Nace, Donald M., to Mobil Oil Corporation. Process for producing light fuel oil. 3,896,024, Cl. 208-74.000.

Nadella S.A.: *See—*
Pitner, Alfred, 3,895,878.

Nagai, Norio: *See—*
Yonemitsu, Eiichi; Kamiyama, Seiichi; Kanada, Toshiaki; and Nagai, Norio, 3,896,185.

Nagel, Robert L., to Beatrice Foods Company. End-viewable, spoke-mountable reflector. 3,895,855, Cl. 350-99.000.

Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, to Bristol-Myers Company. Antibiotic Derivatives. 3,896,106, Cl. 260-210.0AB.

Najarian, George L. Film washer. 3,896,471, Cl. 354-324.000.

Nakagawa, Susumu: *See—*
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 3,896,106.

Nakamura, Zenzo, to Canon Kabushiki Kaisha. Electronic flash device. 3,896,333, Cl. 315-151.000.

Nakao, Hisaji; Kurosaka, Akira; Otani, Katsunori; Tsuzuki, Sadaaki; and Honda, Yuzo, to Toyoda-Koki Kabushiki Kaisha. Machine tool with overhead tool module storage magazine. 3,895,427, Cl. 29-568.000.

Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Circuit for soft-starting electric load comprising temperature sensitive diac. 3,896,369, Cl. 323-19.000.

Nakatsuka, Koki: *See—*
Kondoh, Teruo; and Nakatsuka, Koki, 3,896,446.

Nangia, Suresh K.: *See—*
Matthews, Benjamin H.; Rhine, Jules W.; and Nangia, Suresh K., 3,896,410.

Naoji, Sakakibara: *See—*
Takeshi, Nakane; and Naoji, Sakakibara, 3,895,684.

Natale, Anthony Pete: *See—*
Adams, George Phillip; Gavin, Frederick David, Jr.; and Natale, Anthony Pete, 3,895,434.

Nathanson, Harvey C.; and Guldberg, Jens, to Westinghouse Electric Corporation. Color video display system comprising electrostatically deflectable light valves. 3,896,338, Cl. 315-373.000.

National Research Development Corporation: *See—*
Haywood, George Robert, 3,895,997.
Haywood, George Robert; and Plumstead, Alan David, 3,895,998.
Venables, John Anthony; Pollard, Peter John; and Griffiths, Barrie William, 3,896,308.

Naumann, Robert J., to United States of America, National Aeronautics and Space Administration. Carbon monoxide monitor. 3,895,912, Cl. 23-255.00E.

Naylor, Floyd E., to Phillips Petroleum Company. Preparation of polybutadiene. 3,896,102, Cl. 260-94.300.

NDM Corporation: *See—*
Justus, George Junior; Miller, Lowell C.; and Patrick, Charles T., Jr., 3,895,635.

Necchi Societa per Azioni: *See—*
Perlino, Silvano, 3,895,590.

Negodyaev, Leonid Nikolaevich: *See—*
Lozenko, Valery Konstantinovich; Morozov, Vladimir Alexandrovich; Pavlikhin, Vladimir Serafimovich; Santalov, Anatoly Mikhailovich; Negodyaev, Leonid Nikolaevich; and Kiryanov, Jury Ivanovich, 3,896,349.

Neidecker, Rudolf, to Multi-Contact A.G. Electrical connector. 3,895,853, Cl. 339-272.00R.

Nekula, Ronald M.: *See—*
Hoyer, August; and Nekula, Ronald M., 3,895,790.

Nesterov, Jury Ivanovich: *See—*
Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; and Zimnyakov, Alexandr Vasilievich, 3,895,446.

Neubold, Kurt: *See—*
Rensmann, Leo; Schulde, Felix; Obendorf, Johann; and Neubold, Kurt, 3,896,082.

Neville Chemical Company: *See—*
Henderson, Albert J.; and Krol, John E., 3,896,183.

Newman, Jacques, to Thermotics, Inc. Process for removing sulfur dioxide from gases. 3,896,214, Cl. 423-242.000.

Newsom, Alfred T. Loading apparatus. 3,895,702, Cl. 198-11.000.

Niehaus, William Charles: *See—*
DiLorenzo, James Vincent; Niehaus, William Charles; and Rode, Daniel Leon, 3,896,473.

Niehus, Gunther; and Voss, Hartwig, to Continental Gummi-Werke Aktiengesellschaft. Railway air spring bellows. 3,895,787, Cl. 267-3.000.

Nielsen, Ole Bent Tvaermose: *See—*
Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, 3,896,165.

Nihon Denshi Kabushiki Kaisha: *See—*
Nukui, Shigeru; and Mikazuki, Hideaki, 3,896,314.

Nikiforov, Dmitry Dmitrievich: *See—*
Efimov, Ivan Ivanovich; Lifshits, Mikhail Lvovich; Nikiforov, Dmitry Dmitrievich; Ivanov, Viktor Pavlovich; Linetsky, Lev Efimovich; Lazarev, Vadim Georgievich; and Brenin, Alexandr Ivanovich, 3,896,339.

Nikolaus, Peter: *See—*
Eckert, Hans-Werner; Nikolaus, Peter; and Werner, Claus, 3,896,034.

Nims, Jerry Curtis: *See—*
Lo, Allen Wah; and Nims, Jerry Curtis, 3,895,867.

Ninagawa, Chikato: *See—*
Kobayashi, Torao; and Ninagawa, Chikato, 3,896,009.

Nippon Chemiphar Co., Ltd.: *See—*
Takahashi, Hidehiko; Suzuki, Yoshio; and Kinoshita, Tuyoshi, 3,896,127.

Nippon Electric Company, Limited: *See—*
Ueki, Atsufumi, 3,896,398.
Yano, Takeshi; Futami, Takehiro; and Ookura, Mototsugu, 3,896,401.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Suzuki, Kunio, 3,895,671.

Nippon Kogaku K.K.: *See—*
Ogiwara, Yutaka, 3,895,874.
Toyoda, Kenji, 3,896,456.

Nippon Mining Co., Ltd.: *See—*
Ozaki, Hiromi; Yamane, Mamoru; and Yoshikai, Haruo, 3,896,023.

Nippon Steel Corporation: *See—*
Noda, Akira; Wakako, Atsuhiro; Kodashima, Tadashi; and Tanaka, Akio, 3,895,549.
Watanabe, Shozo; Tanaka, Kiyoshi; and Suga, Yozo, 3,895,974.

Nippondenso Co., Ltd.: *See—*
Endo, Kunio; Kawarada, Junji; Sueishi, Motoharu; Harada, Susumu; and Norimatsu, Hideaki, 3,895,611.

Nishigaki, Takashi: *See—*
Takahashi, Yasunobu; Seko, Maomi; Ide, Akira; Matumoto, Soziro; and Nishigaki, Takashi, 3,896,154.

Nishizawa, Jun-ichi; and Nonaka, Termumoto. Intrinsic semiconductor charge transfer device using alternate transfer of electrons and holes. 3,896,484, Cl. 357-24.000.

Nissan Chemical Industries, Ltd.: *See—*
Yoshida, Akitoshi; Asahara, Koichi; Yanagida, Koichiro; Maruyama, Tadanobu; Takatsu, Ikue; and Kumagai, Yoshiko, 3,895,956.

Nissan Jidosha Kabushiki Kaisha: *See—*
Miyauchi, Toshiyuki, 3,895,542.

Nissan Motor Company Limited: *See—*
Yoshida, Fumio; Sakamoto, Setsuo; and Tatewaki, Shoichi, 3,895,859.

Nissei Plastics Industrial Co., Ltd.: *See—*
Aoki, Katashi, 3,895,747.

Nissen, Warren I., to Gillette Company, The. Lighter. 3,895,905, Cl. 431-254.000.

Nitschke, Heinz, to Rieter Machine Works, Ltd. Apparatus and method for pre-condensing and pressing fiber material into a bale. 3,895,572, Cl. 100-35.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Noda, Yuzuru; Kojima, Makoto; Mazaki, Shiro; and Katashiba, Yasutada, 3,896,089.

Noda, Akira; Wakako, Atsuhiro; Kodashima, Tadashi; and Tanaka, Akio, to Nippon Steel Corporation. Apparatus for shearing of steel strip end in hot finish rolling. 3,895,549, Cl. 83-345.000.

Noda Institute for Scientific Research: *See—*
Kamekura, Masahiro; and Onishi, Hiroshi, 3,896,000.

Noda, Yuzuru; Kojima, Makoto; Mazaki, Shiro; and Katashiba, Yasutada, to Nitto Electric Industrial Co., Ltd. Solution for forming thermal resisting polymers. 3,896,089, Cl. 260-77.5TB.

Nohara, Akira; Umetani, Tomonobu; and Sanno, Yasushi. Chromone derivatives. 3,896,114, Cl. 260-240.00E.

Nohira, Hidetaka; and Ito, Shin, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control system for motor vehicle with catalytic convertor and automatic power transmission mechanism. 3,895,541, Cl. 74-844.000.

Nollen, Bernard, to Obladen, Michael, a part interest. Thermometer. 3,895,523, Cl. 73-356.000.

Nonaka, Termumoto: *See—*
Nishizawa, Jun-ichi; and Nonaka, Termumoto, 3,896,484.

Norimatsu, Hideaki: *See—*
Endo, Kunio; Kawarada, Junji; Sueishi, Motoharu; Harada, Susumu; and Norimatsu, Hideaki, 3,895,611.

Noriyuki, Nagaoka; and Haruo, Niimi, to Kabushiki Kaisha Taihei Seisakusho. Apparatus for preshaping raw logs. 3,895,662, Cl. 144-209.00A.

Norris, Richard C., to Arthur D. Little, Inc. Word processor with right-hand margin control. 3,895,704, Cl. 197-19.000.

Northup, John D. Bottle testing apparatus. 3,895,514, Cl. 73-49.400.

Norton, Thomas K. Frameless picture hanging. 3,895,775, Cl. 248-476.000.

Noyes, James E.: *See—*
Buchanan, George E.; Krone, Donald R.; Krone, Russell R.; and Noyes, James E., 3,895,738.

Nozadze, Gennady Pavlovich: *See—*
Arakelov, Mikhail Alexandrovich; Gersamia, Eduard Galaktionovich; Zedgenidze, Tengiz Grigorievich; and Nozadze, Gennady Pavlovich, 3,895,423.

Nuclear Iberica S.A.: *See—*
Fornes Puget, Enrique, 3,896,342.

NuCon, Inc.: *See—*
Buchtel, Dean H., 3,895,739.

Nudenberg, Walter; Harvey, Merlin P.; and Mann, James Urquhart, to Uniroyal, Inc. Cyclic O,O,S-triesters of phosphorodithioic acid. 3,896,186, Cl. 260-927.00R.

Nudenberg, Walter: *See—*
Visser, Harry D.; and Nudenberg, Walter, 3,896,094.
Visser, Harry D.; and Nudenberg, Walter, 3,896,096.

Nugent, Bede Stanislaus, to Bestnu Engineering Pty. Limited. Intravenous fluids administration apparatus. 3,895,741, Cl. 222-103.000.

Nukui, Shigeru; and Mikazuki, Hideaki, to Nihon Denshi Kabushiki Kaisha. Specimen heating and positioning device for an electron microscope. 3,896,314, Cl. 250-442.000.

Nyborg, Ralph A., to Maran Manufacturing Corporation. Apparatus for feeding, printing and stacking articles. 3,895,574, Cl. 101-37.000.

Obendorf, Johann: *See—*
Rensmann, Leo; Schulde, Felix; Obendorf, Johann; and Neubold, Kurt, 3,896,082.

Oberlinner, Andreas; Baumann, Hans; and Grychtol, Klaus, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2-Oxo-3 spiropyran quinoxalines. 3,896,126, Cl. 260-250.00Q.

Obladen, Michael: *See—*
Nollen, Bernard, 3,895,523.

Obstfelder, Guenther: *See—*
Soehring, Gerhard; Kreutze, Gerhard; and Obstfelder, Guenther, 3,896,491.

Ogasahara, Tunehiko: *See—*
Yamaguchi, Hiroji; and Ogasahara, Tunehiko, 3,895,546.

Ogawa, Francis T.; and Wallace, John D., to Honeywell Inc. Control circuit for an automatic photographic camera. 3,896,459, Cl. 354-31.000.

Ogiso, Mitsutoshi: *See—*
Ichiyanagi, Toshikazu; and Ogiso, Mitsutoshi, 3,896,315.

Ogiwara, Yutaka, to Nippon Kogaku K.K. Circuit for generating sync pulses for use in detecting output signals of spectrophotometer or the like. 3,895,874, Cl. 356-93.000.

Ohba, Masahiro: *See—*
Ishigaki, Yukinobu; Ohwaki, Isao; Sasamura, Kohei; and Ohba, Masahiro, 3,896,271.

Ohi, Reiichi: *See—*
Shiba, Keisuke; Kubodera, Seiiti; Ohi, Reiichi; Shishido, Tadao; Yamamoto, Nobuo; and Sakai, Takeo, 3,895,948.

Ohlschlager, Hans: *See—*
Riester, Oskar; and Ohlschlager, Hans, 3,895,951.

Ohsawa, Mitsuo, to Sony Corporation. Tuning indicator with noise signal detector. 3,896,386, Cl. 325-398.000.

Ohta, Masafumi: *See—*
Kubota, Tomio; Kojima, Katsue; and Ohta, Masafumi, 3,896,112.

Ohwaki, Isao: *See—*
Ishigaki, Yukinobu; Ohwaki, Isao; Sasamura, Kohei; and Ohba, Masahiro, 3,896,271.

Okada, Katsuto; Ishibashi, Akichika; and Watanabe, Hirotaka, to Morinaga Milk Industry Co., Ltd. Compound aseptic valve. 3,895,651, Cl. 137-630.220.

Olander, Charles C.; and Caparone, Michael J., to Robertshaw Control Company. Multispeed control system. 3,896,359, Cl. 318-334.000.

Olevsky, Walter, to Lawrence Peska Associates, Inc., a part interest. Wind operated amphibious vehicle. 3,895,597, Cl. 115-1.00R.

Olin Corporation: *See—*
Hirdler, Louis C., 3,896,213.

Olney, Norman Seth; and Dickinson, Timothy, to Suffolk Lawn Mowers Limited. Lawn mowers. 3,895,481, Cl. 56-17.500.

Olympus Optical Co., Ltd.: *See—*
Imai, Toshihiro, 3,895,857.
Yoshida, Isamu; and Hayasaka, Toshimi, 3,895,770.

Omark Industries, Inc.: *See—*
Froehlking, Adolf, 3,895,431.

Omi, Kyoji, to Ricoh Co., Ltd. Electrostatic recording apparatus with automatic movement of the recording electrodes between a recording and a nonrecording position. 3,896,451, Cl. 346-74.0ES.

Omni Research Incorporated: *See—*
Loken, Bjarte, 3,895,999.

Onishi, Hiroshi: *See—*
Kamekura, Masahiro; and Onishi, Hiroshi, 3,896,000.

Onogi, Seiji, to Yamatake-Honeywell Company Limited. D.C. to D.C. converter with conductive isolation. 3,896,366, Cl. 321-16.000.

Ookura, Mototsugu: *See—*
Yano, Takeshi; Futami, Takehiro; and Ookura, Mototsugu, 3,896,401.

Orion-Yhtyma OY: *See—*
Alberty, Joachim; Salomaa, Eero; Saris, Nils-Erik; Sjostrom, Eero; and Zewi, Gabriel, 3,895,914.

Orlov, Petr Nikolaevich; Nesterov, Jury Ivanovich; Kudashov, Vasily Yakovlevich; and Zimnyakov, Alexandr Vasilievich. Device for measuring surface profiles. 3,895,446, Cl. 33-174.00L.

Ostrowsky, Daniel; Reiber, Louis Marcel; and Poirier, Raymond, to Thomson-CSF. Integrated optical device associating a waveguide and a photodetector and for method manufacturing such a device. 3,896,305, Cl. 250-227.000.

Otani, Katsunori: *See—*
Nakao, Hisaji; Kurosaka, Akira; Otani, Katsunori; Tsuzuki, Sadaaki; and Honda, Yuzo, 3,895,427.

Otomo, Kanji: *See—*
Kosaka, Yujiro; Kuroki, Hitoshi; Echida, Nobuhiro; Otomo, Kanji; and Uemura, Masaru, 3,896,069.

O'Toole, Charles E.: *See—*
Lester, John M.; Crist, Philip W.; and O'Toole, Charles E., 3,896,439.

Otsuka, Hideo; and Inouye, Ken, to Shionogi & Co., Ltd. Azides. 3,896,152, Cl. 260-349.000.

Otto, William M., to JO-Line Tools, Inc. Electronic torque wrench. 3,895,517, Cl. 73-88.50R.

Outboard Marine Corporation: *See—*
Hale, Gordon B., 3,895,845.

Owens-Corning Fiberglas Corporation: *See—*
Miller, Everett R., 3,895,988.

Owens-Illinois, Inc.: *See—*
Brown, Felix H., 3,896,452.
Ernsthausen, Roger E., 3,896,323.
Keyes, Melvin H., 3,896,008.
Schermerhorn, Jerry D., 3,896,327.

Owens, Robert S.: *See—*
Powers, Robert W.; and Owens, Robert S., 3,896,018.

Oy. Nokia AB: *See—*
Stark, Lauri Matti Ulrik, 3,895,411.

Oy Transpak Ab Consulting: *See—*
Hiltunen, Mikko; and Halmekyto, Kaarlo, 3,895,711.

Ozaki, Hiromi; Yamane, Mamoru; and Yoshikai, Haruo, to Nippon Mining Co., Ltd. Process for producing synthetic coking coal. 3,896,023, Cl. 208-46.000.

Ozutsumi, Minoru; Miyazawa, Yoshihide; and Suzuka, Susumu, to Hodogaya Chemical Co., Ltd. Lactone compounds derived from pyridine-carboxylic acids and process for preparing the same. 3,896,116, Cl. 260-240.00D.

Pachins, Jean G., to Societe Anonyme: Poclain. Control circuit for a pressurized fluid engine. 3,895,490, Cl. 60-486.000.

Pacific Adhesives Company: *See—*
Cone, Charles N.; and Steinberg, Julius M., 3,895,984.

Paddison, Denys Ian, to British Secretary of State for Defence. Transportation systems. 3,895,584, Cl. 104-88.000.

Padrick, James D. Tractor-trailer fifth wheel safety lock. 3,895,827, Cl. 280-432.000.

Paetzold, Wolf, to Elster, AG. Tubular swirl flow meter. 3,895,530, Cl. 73-194.00B.

Page, Littleton Dennis. Remotely located apparatus for maintaining the water level within a swimming pool. 3,895,402, Cl. 4-172.170.

Palau, Alfred. Manufacture of protective footwear. 3,896,202, Cl. 264-154.000.

Pall Corporation: *See—*
Campolong, Joseph, 3,895,930.

Palmer, Godfrey Henry Oliver: *See—*
Barrett, James; Kirsop, Brian Heys; and Palmer, Godfrey Henry Oliver, 3,896,001.

Panella, Edward A.: *See—*
Vetter, Ronald F.; Miller, Ray A.; Panella, Edward A.; and Roso-lanka, James J., 3,895,515.

Panigati, Pier Luigi, to Etablissements d'Occident. Sealing assembly. 3,895,815, Cl. 277-171.000.

Papsdorf, John W., to Cardinal of Adrian, Inc. Wire stripping method and device. 3,895,426, Cl. 29-427.000.

Parise, Carl, to Parise & Sons, Inc. Shag rug adapter. 3,895,407, Cl. 15-397.000.

Parise & Sons, Inc.: *See—*
Parise, Carl, 3,895,407.

Parker-Hannifin Corporation: *See—*
Kupfert, Bernard F.; and Bailey, Gerald J., 3,895,814.

Pascale, John V.: *See—*
Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., 3,895,640.

Pasetti, Adolfo: *See—*
Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, 3,896,167.

Pass, Raymond Vincent, to AMP Incorporated. Card reader transport mechanism. 3,896,293, Cl. 235-61.11R.

Patrick, Charles T., Jr.: *See—*
Justus, George Junior; Miller, Lowell C.; and Patrick, Charles T., Jr., 3,895,635.

Patton, Stuart: *See—*
Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., 3,895,640.

Paul, Werner. Air outlet arrangement for air conditioning and ventilating apparatus. 3,895,567, Cl. 98-38.000.

Pauli, Jude A., to Emerson Electric Co. Solenoid valve with threaded core tube. 3,896,405, Cl. 335-281.000.

Paulsen, Uwe: *See—*
Korn, Roland; Seyd, Gunter; and Paulsen, Uwe, 3,895,465.

Pavlikhin, Vladimir Serafimovich: *See—*
Lozenko, Valery Konstantinovich; Morozov, Vladimir Alexandrovich; Pavlikhin, Vladimir Serafimovich; Santalov, Anatoly Mikhailovich; Negodyaev, Leonid Nikolaevich; and Kiryanov, Jury Ivanovich, 3,896,349.

Pearson, David E.: *See—*
White, Roger B.; Pearson, David E.; and Birkner, Hugo E., Jr., 3,895,896.

Peddinghaus, Carl Ullrich. Bending machine for rods, wires and other elongated articles of steel, etc. 3,895,509, Cl. 72-21.000.

Pedersen, James Miller. Propeller pitch indicator. 3,895,883, Cl. 416-61.000.

Peeters, Karel J. A.; and Van De Voorde, Norbert L. C., to Belgonucleaire S.A. Decontamination process for radio-active liquids. 3,896,045, Cl. 252-301.10W.

Peiffer, Howard Richard: *See—*
Bolton, James Alfred; and Peiffer, Howard Richard, 3,895,851.

Pelisson, Claude: *See—*
Cassez, Pierre; and Pelisson, Claude, 3,895,779.

Pelton, Frank M.; Bruder, Joseph A.; and Leney, Thomas F., to Calspan Corporation. High speed video divider with compensation for non-linear functions. 3,896,391, Cl. 328-161.000.

Peltz, John R.; and Szeverenyi, Nikolaus A., to GTE Sylvania Incorporated. Sensing apparatus including latching means. 3,896,424, Cl. 340-244.00R.

Penn Central Transportation Company: *See—*
Bell, Richard M., 3,895,587.

Penn-Plax Plastics, Inc.: *See—*
Goldman, Marvin A., 3,895,605.

Pennsylvania Engineering Corporation: *See—*
Fisher, Howard M., 3,895,783.

Pennwalt Corporation: *See—*
Blum, William A.; and Goltz, Kurt, 3,895,970.

Perdue, Philip T.: *See—*
Becker, Klaus H.; Haywood, Fred F.; Perdue, Philip T.; and Thorngate, John H., 3,896,306.

Peripheral Dynamics, Inc.: *See—*
Schisselbauer, John C.; and Jacobs, James P., 3,896,294.

Perlino, Silvano, to Necchi Societa per Azioni. Automatic apparatus for sewing pockets on garments. 3,895,590, Cl. 112-121.120.

Perrott, Lloyd J.; and Stores, Robert D., to Perrott, Lloyd J., a part interest. Tool for installation of flexible ground conduit. 3,895,496, Cl. 61-63.000.

Persson, Bo Klas Gerhard, to Trelleborgs Gummifabriks Aktiebolag. Wear protection elements for planar or curved surfaces exposed to abrasion. 3,895,982, Cl. 156-71.000.

Pestalozzi, Iwan. Toy and sports device. 3,895,796, Cl. 272-60.00R.

Peters, Leo. Butter pat package. 3,896,239, Cl. 426-119.000.

Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Magnetic switch hinge. 3,896,404, Cl. 335-205.000.

Peterson, Richard H.; and Finch, Robert A. Teaching instrument for keyboard music instruction. 3,895,555, Cl. 84-470.000.

Petro, Claude; and Glise, Andre. Method of making a false tooth. 3,895,443, Cl. 32-8.000.

Petrocci, Alfonso N.: *See—*
Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., 3,895,932.

Pfizer Inc.: *See—*
Bauer, Stuart M., 3,895,474.
McFarland, James W.; and Howes, Harold L., Jr., 3,896,227.
Mylari, Banavara L., 3,896,124.
Mylari, Banavara L.; and Brennan, Thomas M., 3,896,172.
Praglin, Julius; McKie, James E., Jr.; Curtiss, Alan C.; and Longhenry, David K., 3,895,661.

Philadelphia Quartz Company: *See—*
Spencer, Robert W.; and McCready, Newton W., 3,895,995.

Phillipp, Adolf H.; Humber, Leslie G.; Bruderlein, Francois T.; and Gotz, Manfred K., to Ayerst McKenna and Harrison Ltd. Ocathydrobenzocycloheptapyridoisoquinoline derivatives and process for the preparation thereof. 3,896,130, Cl. 260-286.00Q.

Phillips, Austin, to McDonnell Douglas Corporation. Ring pad stress coined structure. 3,895,922, Cl. 29-183.000.

Phillips, Carmen S.; Blanton, Albert G.; and Kenna, Fenton L., Jr., to International Harvester Company. Cylindrical bale forming system. 3,895,573, Cl. 100-88.000.

Phillips, Otto, to International Tools (1973) Ltd. Child-proof dispensing container and cover assembly. 3,895,737, Cl. 221-82.000.

Phillips Petroleum Company: *See—*
Childs, William V., 3,896,022.
Drake, Charles A., 3,896,173.
Drake, Charles A., 3,896,174.
Naylor, Floyd E., 3,896,102.
Walker, John H., 3,896,068.
Wiley, Fred E.; and Turner, Edward W., 3,896,200.
Young, Richard K., 3,895,676.

Phillips, William Lewis, Jr., to du Pont de Nemours, E. I., and Company. Particulate metal filter medium for polymer melts. 3,896,028, Cl. 210-152.000.

Phonics Corporation: *See—*
Sachs, Reynold; and Cicchiello, Frank, 3,896,267.

Pianka, Max, to Murphy Chemical Company Limited, The. S-chloromethyl diethyl phosphorothiolothionate as a soil insecticide. 3,896,219, Cl. 424-225.000.

Pike, John E.: *See—*
Beal, Philip F., III; Lincoln, Frank H., Jr.; and Pike, John E., 3,896,156.

Pinson, Claude M., to Societe Anonyme: Poclain. Circuit for the control of a winch by fluid under pressure including an unwinding position. 3,895,564, Cl. 91-418.000.

Pioneer Electronic Corporation: *See—*
Cho, Mayumi, 3,896,269.

Pipeline Equipment Company E.P.C.O.: *See—*
Laurens, Roger, 3,895,776.

Pitner, Alfred, to Nadella S.A. Coupling element having a split hub. 3,895,878, Cl. 403-344.000.

Pittet, Alan O.; Pascale, John V.; Patton, Stuart; and Brodnitz, Michael H., to International Flavors & Fragrances Inc. Compositions and methods utilizing thio derivatives and processes for producing such derivatives. 3,895,640, Cl. 131-17.00R.

Pittinger, Charles B., Jr. Disk for filament trimmer. 3,895,440, Cl. 30-347.000.

Pitzalis, Mario: *See—*
Vargiu, Silvio; Berti, Renato; and Pitzalis, Mario, 3,896,080.

Plastics Development Corporation of America: *See—*
Michaelis, David E., 3,896,199.

Plepys, Raymond A.; and Jezic, Zdravko, to Dow Chemical Company, The. Iodonium compounds of 3,5-dimethylisoxazole. 3,896,140, Cl. 260-307.00H.

Ploppa, Jurgen. Electronic counter system with variable counting ranges. 3,896,297, Cl. 235-92.0PD.

Plowiecki, Leopold, to Technological Supply S.A. Trocar catheter. 3,895,632, Cl. 128-214.400.

Plummer, Walter A. Powder filled cable splice assembly. 3,896,260, Cl. 174-92.000.

Plumstead, Alan David: *See—*
Haywood, George Robert; and Plumstead, Alan David, 3,895,998.

Plunguian, Mark; and Cornwell, Charles E. Process for forming foamed unsaturated polyester resin products while under a partial vacuum. 3,896,060, Cl. 260-2.50N.

Pluntz, Darrell E., to Inland Container Corporation. Box inverting apparatus. 3,895,722, Cl. 214-1.00Q.

Pohndorf, Henry L.: *See—*
Bird, Forrest M.; and Pohndorf, Henry L., 3,895,642.

Poirier, Raymond: *See—*
Ostrowsky, Daniel; Reiber, Louis Marcel; and Poirier, Raymond, 3,896,305.

Poirier, Robert Victor, to du Pont de Nemours, E. I., and Company. Storage stable aqueous dispersion of tetrafluorethylene polymer. 3,896,071, Cl. 260-29.60F.

Polaroid Corporation: *See—*
Johnson, Bruce K.; and Whiteside, George D., 3,896,458.
Rodgers, Franklin A., 3,896,004.
Stella, Joseph A.; Burke, Edward F., Jr.; and Mason, Paul B., 3,895,862.

Politechnika Gdanska: *See—*
Juchniewicz, Romuald, 3,895,910.

Pollard, Peter John: *See—*
Venables, John Anthony; Pollard, Peter John; and Griffiths, Barrie William, 3,896,308.

Poly-Seal Corporation: *See—*
Koehne, Anthony J.; and Baughan, Harry O., III, 3,895,730.

Pontano, Benjamin Anthony: *See—*
Chitre, Nand Kishore M.; and Pontano, Benjamin Anthony, 3,896,385.

Portage Newspaper Supply Co.: *See—*
Hosterman, Harry L., 3,896,454.

Poskryakov, Jury Maximovich: *See—*
Feoktistov, Evgeny Ilich; Chechulin, Evgeny Arkadievich; Zonov, Nikolai Semenovich; Prozorov, Leonid Kronidovich; Poskryakov, Jury Maximovich; Kremennoi, Grigory Grigorievich; and Goryachy, Vladimir Mikhailovich, 3,896,281.

Post Office, The: *See*—
Jackson, Lynden Ashbrooke, 3,896,402.

Potter, James Charles, to C. A. V. Limited. Governors for fuel pumps. 3,895,619, Cl. 123-140.00R.

Potter, Roy F., to United States of America, Navy. Dual mode CRT screen. 3,896,328, Cl. 313-463.000.

Powers, Robert W.; and Owens, Robert S., to General Electric Company. Method of forming beta-alumina articles. 3,896,018, Cl. 204-181.000.

Powers, Robert W.: *See*—
Mitoff, Stephan P.; Powers, Robert W.; and King, Randall N., 3,896,019.

Powning, Leslie George, to Sturtevant Engineering Co., Limited. Conveyors. 3,895,744, Cl. 222-231.000.

Poy, Guy: *See*—
Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, 3,896,079.

Pozzetti, Mario, to Finike Italiana Marposs, s.a.s. Method for measuring the cutting capacity of the grinding wheel of a grinder. 3,895,526, Cl. 73-104.000.

PPG Industries, Inc.: *See*—
Maximovich, Michael J., 3,896,090.

Praglin, Julius; McKie, James E., Jr.; Curtiss, Alan C.; and Longhenry, David K., to Pfizer Inc. Cuvette apparatus for testing a number of reactants. 3,895,661, Cl. 141-241.000.

Pratt, Ted C.: *See*—
Fletcher, Ralph P., Jr.; and Pratt, Ted C., 3,895,762.

Presberg, Charles D. Rack for tickets and the like. 3,895,720, Cl. 211-50.000.

Priest, John Garrick: *See*—
Keeling, Robert Alan; and Priest, John Garrick, 3,896,249.

Prins, Antoon Adrianus, to Schiedamsche Werktuigenen Machinefabriek N.V. Cylindrical tank sterilizer. 3,895,911, Cl. 21-98.000.

Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, to Snam Progetti S.p.A. Procedure for the production of polymers and copolymers of isobutylene. 3,896,097, Cl. 260-85.30R.

Procter & Gamble Company, The: *See*—
Benjamin, Lawrence; and Connor, Daniel S., 3,896,056.
Smith, Donald Edward, 3,896,238.

Protective Treatments, Inc.: *See*—
Seto, Kenneth Hon; and Thompson, James Thomas, 3,896,245.

Protectoseal Company, The: *See*—
Zehr, William J., 3,895,849.

Prozorov, Leonid Kronidovich: *See*—
Feoktistov, Evgeny Ilich; Chechulin, Evgeny Arkadievich; Zonov, Nikolai Semenovich; Prozorov, Leonid Kronidovich; Poskryakov, Jury Maximovich; Kremennoi, Grigory Grigorievich; and Goryachy, Vladimir Mikhailovich, 3,896,281.

Przybylek, George J., to Burroughs Corporation. Metal mercury capsule. 3,895,709, Cl. 206-84.000.

Pultrusions Corporation, The: *See*—
White, Roger B.; Pearson, David E.; and Birkner, Hugo E., Jr., 3,895,896.

Pun, John Y. Coil forming apparatus and method. 3,895,425, Cl. 29-205.00D.

Pye Limited: *See*—
Dickinson, Brian Arthur Leonard, 3,896,431.

Quell, Peter: *See*—
Forster, Siegfried; Hewing, Gunter; and Quell, Peter, 3,895,492.

Quenzel, Hermann: *See*—
Mengeringhausen, Max; Quenzel, Hermann; Gehrig, Reinhold; and Spanheimer, Willi, 3,895,789.

Radler, Richard William: *See*—
Bergfjord, John Alf; Radler, Richard William; and Millonzi, Richard Phillip, 3,896,184.

Radutsky, Grigory Avramovich: *See*—
Anikanov, Nikolai Ivanovich; Baburin, Evgeny Arkadievich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Frumkin, Mikhail Evseevich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,566.
Anikanov, Nikolia Ivanovich; Grachev, Leonid Pavlovich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,707.

Ramey, William M.: *See*—
Gillette, Carl L.; and Ramey, William M., 3,895,685.

Ranck, Ralph Oliver, to du Pont de Nemours, E. I., and Company. Vinylidene chloride coating composition containing an aromatic polyester and polyester substrates coated with the coating composition. 3,896,066, Cl. 260-28.5AV.

Ranger Tool Co., Inc.: *See*—
Klyce, Thomas A., 3,895,414.

Rank Xerox, Ltd.: *See*—
Sugawara, Kiyoshi, 3,896,279.
Watarai, Syu; and Seoka, Yoshio, 3,895,945.

Rapid-American Corporation: *See*—
Berger, Leonard; and Underhill, Robert A., 3,895,634.

Rassieur, Charles L., to Central Mine Equipment Company. Movable auger rack. 3,895,726, Cl. 214-83.240.

Ravault, Frank Ernest George, to Foseco International Limited. Gas reactors including foam-structured ceramic body with integral internal ceramic baffles. 3,895,917, Cl. 23-277.00C.

Raymond Lee Organization, Inc., The: *See*—
Averette, Beauford E., 3,895,808.
King, Toni B., 3,895,800.

Raynolds, Stuart, to du Pont de Nemours, E. I., and Company. Fluorinated oily soil release agents. 3,896,088, Cl. 260-70.00R.

Raytheon Company: *See*—
Turner, Kenneth R.; and Bryanos, James C., 3,895,435.
Whitehouse, David R.; and Hartshorn, David W., 3,896,396.

RCA Corporation: *See*—
Goodman, Lawrence Alan; and Carlson, David Emil, 3,896,016.
Huang, Ho-Chung; and San-Paolo, Angela, 3,895,429.
Wright, Jerome Edward, 3,896,486.

Reale, John D.: *See*—
Fitzroy, Nancy D.; Mann, Ronald L.; Gerling, Henry B.; and Reale, John D., 3,896,450.

Reardon, Joseph Edward; and Wolff, Vernon Clare, Jr., to du Pont de Nemours, E. I., and Company. Substrates coated with stable pigmented ethylene copolymer dispersions. 3,896,065, Cl. 260-28.5AV.

Rebora, Pierluigi: *See*—
Rescalli, Carlo; Rebora, Pierluigi; and Ginnasi, Alessandro, 3,896,007.

Reboul, Jean Philippe: *See*—
Galves, Jean Pierre; and Reboul, Jean Philippe, 3,896,324.

Recherches Pharmaceutiques et Scientifiques: *See*—
Joullie, Maurice; Lakah, Lucien; Maillard, Gabriel F.; and Muller, Pierre, 3,896,121.

Red Arrow Products Company: *See*—
Moore, Donald G., 3,896,242.

Reed, Russell, Jr.: *See*—
Shaw, Graham C.; and Reed, Russell, Jr., 3,895,578.

Regie Nationale des Usines Renault: *See*—
Castarede, Armand, 3,895,868.
Langlois, Christian Charles, 3,895,881.

Reiber, Louis Marcel: *See*—
Ostrowsky, Daniel; Reiber, Louis Marcel; and Poirier, Raymond, 3,896,305.

Reidl, Hans-Joachim, deceased: *See*—
Kraemer, Stefan; Seidl, Alois; and Reidl, Hans-Joachim, deceased, 3,895,979.

Reidl, Herta Emilie, legal representative: *See*—
Kraemer, Stefan; Seidl, Alois; and Reidl, Hans-Joachim, deceased, 3,895,979.

Rein, Charles R.; and Jones, Charles B., Jr., to United States of America, Navy. Breathing gas heat exchanger. 3,895,675, Cl. 165-164.000.

Reiser, Donald; and Belcher, Ralph. Long persistence display screen supplement to CRT. 3,896,264, Cl. 178-7.800.

Reister, Richard A. Electric razor adapter. 3,896,364, Cl. 320-2.000.

Reliable Electric Company: *See*—
Burtelson, Frederick W., 3,895,879.

Reliance Electric and Engineering Company, The: *See*—
Yeasting, Maynard C., 3,895,692.

Rengo Co., Ltd.: *See*—
Tokuno, Masateru, 3,895,763.

Rensmann, Leo; Schulde, Felix; Obendorf, Johann; and Neubold, Kurt, to Veba-Chemie AG. Epoxy powder coatings and method therefor. 3,896,082, Cl. 260-47.0EN.

Rescalli, Carlo; Rebora, Pierluigi; and Ginnasi, Alessandro, to Snam Progetti S.p.A. pH Control of recycle water in the plural stage distillation of a crude acrylonitrile feed. 3,896,007, Cl. 203-33.000.

Research Corporation: *See*—
Charm, Stanley E.; and Wong, Bing Lou, 3,896,218.
Kupchan, S. Morris; Komoda, Yasuo; Thomas, Gareth J.; and Court, William A., 3,896,111.

Resnick, Paul Raphael, to du Pont de Nemours, E. I., and Company. Decomposition of unstable isomers. 3,896,179, Cl. 260-616.000.

Resta, Vincent A., to Bendix Corporation, The. Solid state DC times AC multiplier. 3,896,301, Cl. 235-194.000.

Reymore, Harold E., Jr.: *See*—
Lockwood, Robert J.; Reymore, Harold E., Jr.; and Thompson, Edward J., 3,896,052.

Reynard, Kennard A.; Gerber, Arthur H.; and Rose, Selwyn H., to Horizons Incorporated. Polyphosphazenes containing the $CF_3CHFCF_2$-$CH_2O$-group. 3,896,058, Cl. 260-2.00P.

Rheinische Braunkohlenwerke AG: *See*—
Josteit, Heinz, 3,895,990.

Rheinstahl Aktiengesellschaft: *See*—
Schops, Rudolf, 3,895,558.

Rhine, Jules W.: *See*—
Matthews, Benjamin H.; Rhine, Jules W.; and Nangia, Suresh K., 3,896,410.

Rhodes, Melvin H., to Rockwell International Corporation. Trigonometric analog-to-digital conversion apparatus. 3,896,299, Cl. 235-150.530.

Rhone-Poulenc, S.A.: *See*—
Boissieras, Jean; Ceyzeriat, Louis; and Poy, Guy, 3,896,079.

Rice, David E., to Minnesota Mining and Manufacturing Company. N,N-dialkylalkanolamines. 3,896,158, Cl. 260-472.000.

Richard, Raymond L., Jr.; and Sampatacos, Peter M., to General Motors Corporation. Face sealing arrangement for automotive waterpumps and the like and face seal assembly therefor. 3,895,811, Cl. 277-22.000.

Richardson, Brian Peter, to Sandoz Ltd. Method for treating nephrises. 3,896,228, Cl. 424-266.000.

Richardson, Claude Alan, to Stanhope-Seta Limited. Viscometric apparatus. 3,895,513, Cl. 73-55.000.

Richardson, James Ivor, to Harris-Intertype Corporation. Printing press instrumentation. 3,896,377, Cl. 324-161.000.

Richmond, Martin R., to Sanders Associates, Inc. Electric signaling system. 3,896,441, Cl. 343-18.00E.

Ricoh Co., Ltd.: *See—*
Kaneda, Tokuzo, 3,895,792.
Omi, Kyoji, 3,896,451.
Riester, Oskar; and Ohlschlager, Hans, to Agfa-Gevaert Aktiengesellschaft. Silver halide emulsion supersensitized with a merocyanine dye and a tertiary phosphine sulfide. 3,895,951, Cl. 96-100.000.
Rieter Machine Works, Ltd.: *See—*
Nitschke, Heinz, 3,895,572.
Rigollot, Georges Alfred. Method and plant for the storage and recovery of energy from a reservoir. 3,895,493, Cl. 60-659.000.
Riker Laboratories, Inc.: *See—*
Gerster, John F., 3,896,131.
Rinne, Erik K. Sports game. 3,895,799, Cl. 273-85.00R.
Rist's Wires & Cables Limited: *See—*
Fry, William Lawrence, 3,896,259.
Ritter, Ernst: *See—*
Bechstein, Herbert; Jaenke, Hans-Jurgen; Muller, Rolf; Ritter, Ernst; Staudt, Heinrich; Tomasch, Helmut; and Urlberger, Alois, 3,895,537.
Robert Bosch G.m.b.H.: *See—*
Bechstein, Herbert; Jaenke, Hans-Jurgen; Muller, Rolf; Ritter, Ernst; Staudt, Heinrich; Tomasch, Helmut; and Urlberger, Alois, 3,895,537.
Kipp, Dieter, 3,896,350.
Muller, Jurgen, 3,896,468.
Rudert, Frithjof; Muller, Rolf; and Gornott, Dietmar, 3,896,489.
Steinke, Leo, 3,895,616.
Roberts, Alfred M., to Campbell Chain Company. Cross chain hook. 3,895,419, Cl. 24-230.5CR.
Roberts, Maurice Paul, to TRW Inc. Hydrostatic control unit. 3,895,888, Cl. 418-61.00B.
Robertshaw Control Company: *See—*
Olander, Charles C.; and Caparone, Michael J., 3,896,359.
Robins, Roland K.: *See—*
Rousseau, Robert J.; and Robins, Roland K., 3,896,135.
Robinson, Glen: *See—*
Larralde, Edward; and Robinson, Glen, 3,895,780.
Robinson, Richard L.; and Volgyesy, Ivan L., to Indian Head, Inc. Electrical junction and switch boxes. 3,895,732, Cl. 220-3.500.
Rochling, Hans; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Novel triazino-benzimidazoles. 3,896,120, Cl. 260-249.500.
Rockwell International Corporation: *See—*
Blakeslee, Dirk C.; and Farrell, Thomas C., 3,895,532.
Ehman, Michael F.; and Austerman, Stanley B., 3,895,921.
Rhodes, Melvin H., 3,896,299.
Sujdak, Thomas J.; and Anderson, Douglas W., 3,895,655.
Rode, Daniel Leon: *See—*
DiLorenzo, James Vincent; Niehaus, William Charles; and Rode, Daniel Leon, 3,896,473.
Rodgers, Franklin A., to Polaroid Corporation. Distillation system utilizing a microporous stack. 3,896,004, Cl. 202-167.000.
Rodler, Hans. Apparatus for producing an interference signal at a selected location. 3,895,639, Cl. 128-422.000.
Rodriquez, Edward T., to Creative Technology Corporation. Multiple level lamp adapter. 3,896,334, Cl. 315-194.000.
Rogers, Donald Burl: *See—*
Bouchard, Robert Joseph; and Rogers, Donald Burl, 3,896,055.
Rohm and Haas Company: *See—*
Kilbourn, Edward E., 3,896,134.
Larsson, Bjorn E.; and Le Sota, Stanley, 3,896,085.
Rohr, Ulrich, to Deutsche Texaco Aktiengesellschaft. Method and apparatus for logging the course of a borehole. 3,896,412, Cl. 340-15.5BA.
Roland Mfg. Co.: *See—*
Roland, Max, 3,895,764.
Roland, Max, to Roland Mfg. Co. Dental retracting device. 3,895,764, Cl. 242-107.600.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Cappel, Bert; Schuhmann, Siegfried; and Wolf, Klaus, 3,895,575.
Rollei-Werke Franke & Heidecke: *See—*
Decker, Hans-Heino, 3,896,337.
Ronson Corporation: *See—*
Kimball, Everett L., 3,895,904.
Roper Corporation: *See—*
Znamirowski, Henry; and Fielder, William Vanburen, Jr., 3,895,410.
Rose, Andrew M.; and Bryan, Geoffrey L. Automated broadcast programmer. 3,896,490, Cl. 360-69.000.
Rose, Selwyn H.: *See—*
Reynard, Kennard A.; Gerber, Arthur H.; and Rose, Selwyn H., 3,896,058.
Rosen, Harold A.: *See—*
Hudspeth, Thomas; Rosen, Harold A.; and Walsh, Bernard L., Jr., 3,896,262.
Rosenberg, Ira, to Clairol Incorporated. UV Curable polyene-polythiol-surfactant compositions. 3,896,014, Cl. 204-159.230.
Rosenburg, Charles W., Jr., to F. N. Burt Company, Inc. Tapered carton assembly containing filler carton. 3,895,754, Cl. 229-23.00R.
Rosner, Kurt, to Hazemag Dr. E. Andreas KG. Composting installation. 3,895,916, Cl. 23-259.100.
Rosolanka, James J.: *See—*
Vetter, Ronald F.; Miller, Ray A.; Panella, Edward A.; and Rosolanka, James J., 3,895,515.
Ross, John William Ellis: *See—*
Baker, Basil Offor; and Ross, John William Ellis, 3,896,343.
Roteman, Jerome, to American Can Company. Epoxy resin photoresist with iodoform and bismuth triphenyl. 3,895,954, Cl. 96-115.00R.
Roth, Walter: *See—*
Jvirblis, Alex E.; and Roth, Walter, 3,896,310.
Rothschild, Stanley: *See—*
Fishman, Jack, 3,896,226.
Rousseau, Robert J.; and Robins, Roland K., to ICN Pharmaceuticals, Inc. 3-Deazaguanine. 3,896,135, Cl. 260-296.00H.
Rozgonyi, George Arthur: *See—*
Di Lorenzo, James Vincent; and Rozgonyi, George Arthur, 3,896,479.
Rucker, Stanley E. Poultry transport system. 3,895,727, Cl. 214-85.000.
Rudert, Frithjof; Muller, Rolf; and Gornott, Dietmar, to Robert Bosch G.m.b.H. Electronic tape editing equipment. 3,896,489, Cl. 360-14.000.
Rulo, Charles J. Roadway detour system for vehicles. 3,896,414, Cl. 340-31.00R.
Russell, Carl D., to Aquarius, Inc. Indexing panel installer. 3,895,721, Cl. 214-1.00H.
Ryan, John W. Duct coating apparatus. 3,895,604, Cl. 118-306.000.
Rym, Christian, to ACEC (Ateliers de Constructions Electriques de Charleroi). Voltage regulating device. 3,896,368, Cl. 323-8.000.
S.A. Ulmer Aeronautique: *See—*
Delest, Rene, 3,895,625.
S&C Electric Company: *See—*
Chabala, Leonard Valentine, 3,896,282.
Sachs, Reynold; and Cicchiello, Frank, to Phonics Corporation. Telecommunications system for the hearing impaired utilizing Baudot-ASCII code selection. 3,896,267, Cl. 179-2.0TV.
Sack, Ernest Theodor, to Maschinenfabrik Sack GmbH. Multiple-part machine frame for presses, rolling mills or the like. 3,895,512, Cl. 72-455.000.
Sackinger, James P.: *See—*
Enck, Richard S., Jr.; and Sackinger, James P., 3,896,331.
Sacrini, Egeo; and Cavallotti, Claudio, to BF Goodrich Company, The. Organic peroxides derived from unsaturated compounds. 3,896,176, Cl. 260-610.00R.
Sagami, Hiroshi: *See—*
Akamatsu, Kiyoshi; Yokota, Yuzo; Sagami, Hiroshi; and Imai, Isao, 3,895,949.
Saguaro Industries, Inc.: *See—*
Gillespie, John Francis, 3,896,197.
Saguchi, Kenji; and Hiraiwa, Takashi. Spray dryer. 3,895,994, Cl. 159-4.00B.
Sahara, Masayoshi; and Tominaga, Sinji, to Minolta Camera Kabushiki Kaisha. Electric shutter for programmed exposure control. 3,896,460, Cl. 354-38.000.
Saines, George S.: *See—*
Yamamoto, Roy Isamu; and Saines, George S., 3,896,074.
Saint-Gobain Industries: *See—*
Mabru, Marcel, 3,896,201.
Saito, Mitsutaka: *See—*
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; Kimura, Masatoshi; and Saito, Mitsutaka, 3,896,067.
Sakai Chemical Industry Company, Limited: *See—*
Kotone, Akira; Hiri, Yoshiyuki; and Masada, Tadashi, 3,896,149.
Sakai, Takeo: *See—*
Shiba, Keisuke; Kubodera, Seiiti; Ohi, Reiichi; Shishido, Tadao; Yamamoto, Nobuo; and Sakai, Takeo, 3,895,948.
Sakai, Yoshitada: *See—*
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Sakamoto, Akira, to Daiden Co., Inc. Storage battery for vehicles. 3,895,964, Cl. 136-182.000.
Sakamoto, Setsuo: *See—*
Yoshida, Fumio; Sakamoto, Setsuo; and Tatewaki, Shoichi, 3,895,859.
Sakhuja, Ravinder K., to Thermo Electron Corporation. Combustor. 3,895,608, Cl. 122-250.00R.
Sakurai, Yoshitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Intake manifold device of an internal combustion engine. 3,895,617, Cl. 123-122.0AB.
Salomaa, Eero: *See—*
Alberty, Joachim; Salomaa, Eero; Saris, Nils-Erik; Sjostrom, Eero; and Zewi, Gabriel, 3,895,914.
Samonov, Valentin Terentievich: *See—*
Levin, Solomon Isaakovich; Samonov, Valentin Terentievich; Tsygankin, Nikolai Ivanovich; and Khoroncko, Nadezhda Serafimovna, 3,895,706.
Sampatacos, Peter M.: *See—*
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Heminway, John R.; and Sanborn, Herbert M., 3,896,442.
Sanders Associates, Inc.: *See—*
Richmond, Martin R., 3,896,441.
Sanders, Thomas J., to Harris Corporation. Method of fabricating a bipolar transistor. 3,895,977, Cl. 148-187.000.
Sandoz, Inc.: *See—*
Houlihan, William J.; and Manning, Robert E., 3,896,232.
Kathawala, Faizulla G., 3,896,143.
Sandoz Ltd.: *See—*
Lal Kaul, Bansi, 3,896,113.
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Sangamo Electric Company: *See—*
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Sanno, Yasushi: *See*—
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San-Paolo, Angela: *See*—
Huang, Ho-Chung; and San-Paolo, Angela, 3,895,429.

Santalov, Anatoly Mikhailovich: *See*—
Lozenko, Valery Konstantinovich; Morozov, Vladimir Alexandrovich; Pavlikhin, Vladimir Serafimovich; Santalov, Anatoly Mikhailovich; Negodyaev, Leonid Nikolaevich; and Kiryanov, Jury Ivanovich, 3,896,349.

Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., to American Home Products Corporation. (2-Pyrimidinylthio) alkanoic acids, esters, amides and hydrazides. 3,896,129, Cl. 260-256.500.

Sarantakis, Dimitrois: *See*—
McKinely, Wayne A.; and Sarantakis, Dimitrois, 3,896,104.

Saris, Nils-Erik: *See*—
Alberty, Joachim; Salomaa, Eero; Saris, Nils-Erik; Sjostrom, Eero; and Zewi, Gabriel, 3,895,914.

Sarka, Albert J., to Harris-Intertype Corporation. Method of making die plates. 3,895,947, Cl. 96-36.000.

Sarnoff, Stanley J.: *See*—
Bartner, Elliot; Curley, Edward M.; Kaplan, Sheldon; and Sarnoff, Stanley J., 3,895,633.

Sasaki, Yoshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal means of a rotary engine. 3,895,892, Cl. 418-142.000.

Sasamura, Kohei: *See*—
Ishigaki, Yukinobu; Ohwaki, Isao; Sasamura, Kohei; and Ohba, Masahiro, 3,896,271.

Sato, Kikumasa; Inoue, Seiichi; Kijima, Shizumasa; and Hamamura, Kimio, to Eisai Company, Ltd. Synthesis of quinone derivatives having biological activity. 3,896,153, Cl. 260-396.00R.

Sauve, Delsford B., to Lawrence Peska Associates, Inc., a part interest. Blender packing device. 3,895,548, Cl. 81-1.00R.

Savkar, Sudhir D.; Giles, Walter B.; and Tatge, Robert B., to General Electric Company. Acoustic attenuator providing relatively high insertion loss at low frequencies. 3,895,686, Cl. 181-56.000.

Sawada, Daisaku; and Takeda, Yuji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Spark plug operable with a floating arc. 3,896,322, Cl. 313-142.000.

Sawano, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Lens barrel. 3,895,858, Cl. 350-255.000.

Scaife, Ronald: *See*—
Wall, Christopher; Scaife, Ronald; and Wood, Thomas A., 3,895,843.

Scarpa, Paul E. Tennis marking tape and method of making same. 3,896,248, Cl. 428-172.000.

Scheck, Harold G. Security clamp. 3,895,768, Cl. 248-19.000.

Scheel, Klaus; and Luthe, Wolfgang. Method for cleansing surfaces of buildings and passage-ways. 3,895,957, Cl. 134-34.000.

Schelkmann, Wilhelm. Method of repairing tires and shells used for this method. 3,895,985, Cl. 156-96.000.

Schering Corporation: *See*—
Shapiro, Elliot L.; and Ganguly, Ashit K., 3,896,220.

Schermerhorn, Jerry D., to Owens-Illinois, Inc. Monolithic gas discharge display device. 3,896,327, Cl. 313-220.000.

Schiedamsche Werktuigenen Machinefabriek N.V.: *See*—
Prins, Antoon Adrianus, 3,895,911.

Schimmerling, Michel Gerard. Device for programming and selecting documents. 3,895,717, Cl. 209-80.500.

Schisselbauer, John C.; and Jacobs, James P., to Peripheral Dynamics, Inc. Plural mode card reading apparatus. 3,896,294, Cl. 235-61.11E.

Schittek, Friedrich: *See*—
Willenbrock, Helmut; and Schittek, Friedrich, 3,895,647.

Schlauer, Johann: *See*—
Bratzler, Karl; Doerges, Alexander; and Schlauer, Johann, 3,896,215.

Schlesinger, Sheldon I., to American Can Company. Phototropic compounds as acid catalyst for epoxy materials. 3,895,952, Cl. 96-115.00R.

Schlicht, Raymond C.; and Eckert, George W., to Texaco Inc. Motor fuel composition. 3,895,925, Cl. 44-72.000.

Schluter, Wilhelm: *See*—
Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; Schluter, Wilhelm; and Beckschulte, Heinrich, 3,895,781.

Schmelow, Harald Martin: *See*—
Weman, Per Olaf; and Schmelow, Harald Martin, 3,895,539.

Schmidt, William. Flexible forceps. 3,895,636, Cl. 128-305.000.

Schmitt, James L.; Castle, Clarence L., Jr.; and Kessinger, Orville E., Jr., to Caterpillar Tractor Co. Combined steering clutch and brake control for crawler tractors. 3,895,703, Cl. 192-13.00R.

Schneider, Bruce H.: *See*—
Kaufman, Burton; and Schneider, Bruce H., 3,895,865.

Schneider, Fernand: *See*—
Bernauer, Karl; Borgulya, Janos; and Schneider, Fernand, 3,896,132.

Schops, Rudolf, to Rheinstahl Aktiengesellschaft. Support system. 3,895,558, Cl. 89-36.00K.

Schotthoefer, Jerome W.; and Colasanti, Arduino, to Allied Chemical Corporation. Inflation apparatus for safety device. 3,895,821, Cl. 280-150.0AB.

Schottler, Henry. Variable displacement fluid transducer. 3,895,565, Cl. 91-492.000.

Schrader, Leo W., Jr., to United States of America, Navy. Tracking radar countermeasure. 3,896,438, Cl. 343-18.00E.

Schreiner, Max P.; and Hyltin, Tom M., to Texas Instruments Incorporated. Solid state fluorescent lamp ballast system. 3,896,336, Cl. 315-226.000.

Schubeck, Phillip A., to Ford Motor Company. Carburetor throttle valve positioner. 3,895,615, Cl. 123-103.00R.

Schudel, Peter: *See*—
Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,896,175.

Schuhmann, Siegfried: *See*—
Cappel, Bert; Schuhmann, Siegfried; and Wolf, Klaus, 3,895,575.

Schulde, Felix: *See*—
Rensmann, Leo; Schulde, Felix; Obendorf, Johann; and Neubold, Kurt, 3,896,082.

Schultz, William J.; and Smith, Samuel, to Minnesota Mining and Manufacturing Company. Pile fabric treating composition providing soil resistance. 3,896,035, Cl. 252-8.750.

Schulz, Gunter; and Igel, Wolfgang, to Zinser-Textilmaschinen GmbH. Bobbin changing apparatus. 3,895,482, Cl. 57-52.000.

Schulze, Harry O.: *See*—
Mehalchick, Emil J.; Cleveland, Joseph J.; Long, Robert A.; Schulze, Harry O.; and Marshall, Paul K., 3,896,048.

Schulze, Juergen: *See*—
Gruette, Friedrich-Karl; Schulze, Juergen; and Hampel, Heinz-Georg, 3,896,240.

Schwarz, Wilhelm, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Jaw coupling. 3,895,502, Cl. 64-14.000.

Schwarzler, Peter, to Krauss-Maffei Aktiengesellschaft. Two-sided linear induction motor especially for suspended vehicles. 3,895,585, Cl. 104-148.0LM.

Schwarzmann, Gunter: *See*—
Holtschmidt, Ulrich; and Schwarzmann, Gunter, 3,896,171.

Schwarzmann, Matthias: *See*—
Broecker, Franz Josef; Heners, Juergen; Marosi, Laszlo; Schwarzmann, Matthias; and Laurer, Peter Rudolf, 3,896,053.

Schweppes Limited: *See*—
French, John A.; and Turner, John C., 3,895,660.

Scientific Systems, Inc.: *See*—
Stone, Stanley Allan, 3,895,534.

Scotese, Anthony C.: *See*—
Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., 3,896,129.

Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The: *See*—
Sturgeon, John Royal, 3,895,528.

Sedivy, Stanley J., to Zenith Radio Corporation. System for suspending a color selection electrode in a color cathode ray tube. 3,896,321, Cl. 313-404.000.

Seelig, Johann: *See*—
Strutz, Hans-Jurgen; Jacob, Ingolf; and Seelig, Johann, 3,895,420.

Sehring, Richard; and Buck, Wolfgang, to Boehringer Ingelheim GmbH. Process for the preparation of thionophosphoric and thionophosphonic acid esters. 3,896,192, Cl. 260-982.000.

Seidl, Alois: *See*—
Kraemer, Stefan; Seidl, Alois; and Reidl, Hans-Joachim, deceased, 3,895,979.

Seiffert, Ulrich; and Struwe, Burckhard, to Volkswagenwerk Aktiengesellschaft. Safety device. 3,895,822, Cl. 280-150.05B.

Seiller, Pierre Francois Xavier, to Le Presentroir Seiller. Display stand for eyeglasses. 3,895,718, Cl. 211-13.000.

Sekigawa, Toshihiro: *See*—
Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, 3,895,978.

Sekmakas, Kazys, to DeSoto, Inc. Electrodeposition of thermosetting coating at the cathode. 3,896,017, Cl. 204-181.000.

Seko, Maomi: *See*—
Takahashi, Yasunobu; Seko, Maomi; Ide, Akira; Matumoto, Soziro; and Nishigaki, Takashi, 3,896,154.

Selin, Terry G.: *See*—
DeZuba, George P.; Berger, Abe; and Selin, Terry G., 3,896,123.

Sellstedt, John H., to American Home Products Corporation. Process for preparation of 6-aminopenicillanic acid. 3,896,110, Cl. 260-239.100.

Semikron Gesellschaft fur Gleichrichterbau u. Elektronik m.b.H.: *See*—
Berkner, Rolf, 3,896,254.

Sencore, Inc.: *See*—
Streed, Ramer W., 3,896,268.

Seng, Florin; Ley, Kurt; and Metzger, Karl Georg, to Bayer Aktiengesellschaft. Compositions containing a carbonamidoquinoxaline-di-N-oxide and method of using same. 3,896,222, Cl. 424-248.000.

Seoka, Yoshio: *See*—
Watarai, Syu; and Seoka, Yoshio, 3,895,945.

Serrano, Salomon. Entry control device. 3,896,316, Cl. 307-149.000.

Servicios de Ingenieria, Proyectos Y Estudios/(SIPE): *See*—
de Delas y de Ugarte, Eduardo, 3,895,782.

Seto, Kenneth Hon; and Thompson, James Thomas, to Protective Treatments, Inc. Pressure sensitive adhesive strips and sheets. 3,896,245, Cl. 428-7.000.

Seyd, Gunter: *See*—
Korn, Roland; Seyd, Gunter; and Paulsen, Uwe, 3,895,465.

Shapiro, Elliot L.; and Ganguly, Ashit K., to Schering Corporation. Method of treating fungal infections with azido compounds. 3,896,220, Cl. 424-226.000.

Sharp, Larry L., to Illinois Tool Works Inc. Shelf support clip. 3,895,774, Cl. 248-243.000.

Shaw, Graham C.; and Reed, Russell, Jr., to Thiokol Corporation. Flare with adhesive liner. 3,895,578, Cl. 102-37.800.

Shay, Edward Griffin: *See—*
Merianos, John J.; Shay, Edward Griffin; Adams, Phillip; and Petrocci, Alfonso N., 3,895,932.

Shell Oil Company: *See—*
Howard, Colin C.; Johnstone, Robert A. W.; and Entwistle, Ian D., 3,896,002.

Shema, Bernard F.; and Brink, Robert H., Jr., to Betz Laboratories, Inc. Slime control compositions and their use. 3,896,229, Cl. 424-270.000.

Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. 2,2-dibromo-3-nitrilopropionamide and hexachlorodimethylsulfone as a slime control composition. 3,896,231, Cl. 424-304.000.

Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. Slime control compositions and their use. 3,896,236, Cl. 424-329.000.

Shepherd, Robert Carl, to Johnson & Johnson. Method and apparatus for tearing sections from a web. 3,895,751, Cl. 225-3.000.

Sheppard, Robert Charles: *See—*
Hardy, Paul Martin; Kenner, George Wallace; Sheppard, Robert Charles; Morley, John Selwyn; and MacLeod, John Keith, 3,896,103.

Shiba, Keisuke; Kubodera, Seiiti; Ohi, Reiichi; Shishido, Tadao; Yamamoto, Nobuo; and Sakai, Takeo, to Fuji Photo Film Co., Ltd. Silver halide light-sensitive material containing a heterocyclic thione and a polyalkylene oxide. 3,895,948, Cl. 96-76.00R.

Shimada, Shunji: *See—*
Hatsukano, Yoshikazu; and Shimada, Shunji, 3,896,388.

Shimizu, Kanryo: *See—*
Inaba, Seiuemon; Shimizu, Kanryo; Hashimoto, Yoshihiro; Amemiya, Youichi; and Usami, Hiroshi, 3,896,361.

Shimizu, Sadami: *See—*
Mabuchi, Shunsuke; Tsuzuki, Kenji; Matsunaga, Hideaki; Shimizu, Sadami; and Sumita, Makoto, 3,896,051.

Shinozaki, Mamoru: *See—*
Akazaki, Shigeru; Endo, Masaaki; and Shinozaki, Mamoru, 3,895,495.

Shionogi & Co., Ltd.: *See—*
Otsuka, Hideo; and Inouye, Ken, 3,896,152.

Shiraishi, Yoshiaki. Circulative catering table. 3,895,691, Cl. 186-1.00R.

Shishido, Tadao: *See—*
Shiba, Keisuke; Kubodera, Seiiti; Ohi, Reiichi; Shishido, Tadao; Yamamoto, Nobuo; and Sakai, Takeo, 3,895,948.

Shockley, Charles Glenn, to Lawrence Peska Associates, Inc., a part interest. Ball return device. 3,895,809, Cl. 273-182.00R.

Sianesi, Dario; Pasetti, Adolfo; and Corti, Costante, to Montecatini Edison S.p.A. Perfluorinated linear polyethers. 3,896,167, Cl. 260-544.00F.

Sieffert, William G., to Hoerner Waldorf Corporation. Protective container. 3,895,712, Cl. 206-424.000.

Siegelin, Werner: *See—*
Gawlick, Heinz; Kuschel, Hans; Marondel, Gunther; Siegelin, Werner; and Spranger, Wolfgang, 3,895,579.

Siemens Aktiengesellschaft: *See—*
Blaschke, Felix, 3,896,351.
Diepers, Heinrich; Jablonski, Karl-Heinz; and Lamamatsch, Hans, 3,895,432.
Koch, Christian, 3,895,488.
Korn, Roland; Seyd, Gunter; and Paulsen, Uwe, 3,895,465.
Loderer, Peter, 3,896,348.
Meyer, Jurgen; and Waller, Siegfried, 3,896,360.

Sigg-Grutter, Trudi: *See—*
Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,896,175.

Sigh, Jack F.: *See—*
Kolb, William A.; and Sigh, Jack F., 3,895,784.

Sigmatex A.G.: *See—*
Weman, Per Olaf; and Schmelow, Harald Martin, 3,895,539.

Silec-Semi-Conducteurs: *See—*
Dumas, Guy H., 3,895,976.

Silverman, Elliott; and Cohen, Morton. Adhesive compositions. 3,895,445, Cl. 32-14.00R.

Simpson, John: *See—*
MacRae, Alfred Urquhart; Miller, Paul; Moline, Robert Alan; and Simpson, John, 3,895,965.

Singer Company, The: *See—*
Harvell, Don L., 3,895,710.
Killinger, Karl H., 3,895,591.
Wiedeman, Charles W., 3,896,291.

Sink, Robert L. Exercise cycle. 3,895,825, Cl. 280-234.000.

Sinniger, Edgar, to Micagil A.G. Circuit arrangement for testing insulation by partial discharge technique. 3,896,376, Cl. 324-158.0MG.

Siporex-Francais S.A.R.L.: *See—*
Goransson, Rolf Erik, 3,895,551.

Sirven, Jacques, to Thomson-CSF. Pulse type radar system. 3,896,434, Cl. 343-5.0SA.

Sjostrom, Eero: *See—*
Alberty, Joachim; Salomaa, Eero; Saris, Nils-Erik; Sjostrom, Eero; and Zewi, Gabriel, 3,895,914.

Skvarenina, John A. Sight glass for metal liquid containers. 3,895,522, Cl. 73-323.000.

Sliva, Daniel E.: *See—*
Aycock, David F.; and Sliva, Daniel E., 3,896,047.

Small, Irwin A. Mandibular staple and drill guide. 3,895,444, Cl. 32-10.00A.

Smith, Donald Edward, to Procter & Gamble Company, The. Dermatological compositions. 3,896,238, Cl. 424-358.000.

Smith, John R.: *See—*
Mahlandt, Lavern N.; Smith, John R.; Elliott, Floyd R.; and Greene, Larry D., 3,895,623.

Smith, Samuel: *See—*
Schultz, William J.; and Smith, Samuel, 3,896,035.

Smith, Stanley B., Jr.: *See—*
Dennison, Allan G.; Bancroft, Martha F.; Smith, Stanley B., Jr.; and Tolkoff, Marc Joshua, 3,895,873.

Smith, Thomas Woods, to Lubrizol Corporation, The. Aqueous dispersions of film-forming. 3,896,073, Cl. 260-29.6RW.

SmithKline Corporation: *See—*
Baile, Clifton A.; Bender, Paul E.; and Loev, Bernard, 3,896,137.
Brenner, L. Martin; and Loev, Bernard, 3,896,233.
Craig, Paul N.; and Zirkle, Charles L., 3,896,133.
Loev, Bernard, 3,896,148.
Sutton, Blaine M., 3,896,234.

Smrcka, Joseph G., to Alderson Research Laboratories, Inc. Breakable leg. 3,895,451, Cl. 35-17.000.

Snam Progetti S.p.A.: *See—*
Priola, Aldo; Cesca, Sebastiano; and Ferraris, Giuseppe, 3,896,097.
Rescalli, Carlo; Rebora, Pierluigi; and Ginnasi, Alessandro, 3,896,007.

Snel AG: *See—*
Ehrenberg, Henry; and Hirsch, Mordechai-Gustav, 3,895,439.

Snyder, Elizabeth M. Medical instrument retainer. 3,895,629, Cl. 128-171.000.

Snyder, Francis Henry, to Lone Star Industries, Inc. Method and apparatus for shattering shock-severable solid substances. 3,895,760, Cl. 241-5.000.

Socias, Arturo. Tape-cassette holder for magnetophonic recording and reproduction apparatus. 3,896,492, Cl. 360-93.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Valoti, GianFranco; and Antonini, Giancarlo, 3,896,093.
Vargiu, Silvio; Berti, Renato; and Pitzalis, Mario, 3,896,080.

Societe Anonyme Automobiles Citroen: *See—*
Cadiou, Jean, 3,895,650.

Societe Anonyme: Poclain: *See—*
Pachins, Jean G., 3,895,490.
Pinson, Claude M., 3,895,564.

Societe de Vente de l'Aluminium Pechiney: *See—*
Cospen, Jean; and Baumann, Bernard, 3,896,207.

Societe Honeywell Bull (Societe Anonyme): *See—*
Delorme, Raymond Louis, 3,896,285.

Societe Industrielle Generale de Mecanique Applique S.I.G.M.A.: *See—*
Leblanc, Jean, 3,895,886.

Soehring, Gerhard; Kreutze, Gerhard; and Obstfelder, Guenther, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Setting mechanism for the pickup head of a disc storage system, especially for teaching purposes. 3,896,491, Cl. 360-86.000.

Solo, Alan J., to Knock-N-Lok International, Inc. Molded wall fastener. 3,895,773, Cl. 248-217.000.

Sommer, Manfred. Rotary piston pump. 3,895,893, Cl. 418-153.000.

Sony Corporation: *See—*
Ohsawa, Mitsuo, 3,896,386.

Southern Illinois University Foundation: *See—*
Meyers, Cal Yale; and Malte, Ashok M., 3,896,164.

Spanheimer, Willi: *See—*
Mengeringhausen, Max; Quenzel, Hermann; Gehrig, Reinhold; and Spanheimer, Willi, 3,895,789.

Spectrol Electronics Corporation: *See—*
DeLong, Robert J., 3,895,600.

Spencer Industries, Inc.: *See—*
Chambers, Herbert R., 3,895,733.

Spencer, Robert W.; and McCready, Newton W., to Philadelphia Quartz Company. Film drying of hydrated alkali metal silicate solutions. 3,895,995, Cl. 159-49.000.

Sperry Rand Corporation: *See—*
Flannery, William E., 3,896,421.
Lester, John M.; Crist, Philip W.; and O'Toole, Charles E., 3,896,439.
Morris, Richard H., 3,896,437.

Sperry-Sun Well Surveying Company: *See—*
McArthur, Billy W., 3,895,527.

Spotnails, Inc.: *See—*
El Guindy, Samir, 3,895,562.

Sprague Electric Company: *See—*
Bilotti, Alberto; and Lutz, Ronald W., 3,896,383.
Coleman, James H.; and Lo, Jyh-Shuey, 3,896,354.
MacDougall, John D.; and Manchester, Kenneth E., 3,895,966.

Spranger, Wolfgang: *See—*
Gawlick, Heinz; Kuschel, Hans; Marondel, Gunther; Siegelin, Werner; and Spranger, Wolfgang, 3,895,579.

Stach, Leonard J., to Velsicol Chemical Corporation. S-(2-methoxyiminoethyl) O-ethyl-N-isopropylthiolo-phosphoramidate. 3,896,189, Cl. 260-944.000.

Standard Oil Company, The: *See—*
Herold, Albert J.; Koch, Paul E.; and Adams, Richard C., 3,895,900.

Stanhope-Seta Limited: *See—*
Richardson, Claude Alan, 3,895,513.

Stark, Lauri Matti Ulrik, to Oy. Nokia AB. Hinge, in particular for coupled window constructions. 3,895,411, Cl. 16-131.000.

Startz, Ambrose J.: *See*—
Coleman, Richard L.; Cummins, Billy H.; and Startz, Ambrose J., 3,896,025.

Staudt, Heinrich: *See*—
Bechstein, Herbert; Jaenke, Hans-Jurgen; Muller, Rolf; Ritter, Ernst; Staudt, Heinrich; Tomasch, Helmut; and Urlberger, Alois, 3,895,537.

Stauffer Chemical Company: *See*—
Tilles, Harry, 3,896,168.
Tilles, Harry; and Casida, John E., 3,896,169.
Weil, Edward D., 3,896,187.

Stayner, Robert A., to Chevron Research Company. Activated soldering flux. 3,895,973, Cl. 148-25.000.

Stefanelli, Louis J.: *See*—
Bockowski, Edmund J.; and Stefanelli, Louis J., 3,895,913.

Steier, Moshe. Sucking measure. 3,895,533, Cl. 73-409.000.

Stein, Paul D.: *See*—
Zelby, Leon W., 3,896,373.

Steinbatz, Alfred, to C. Reichert Optische Werke AG. Apparatus for controlling the exposure of photographic film. 3,896,455, Cl. 354-24.000.

Steinberg, Julius M.: *See*—
Cone, Charles N.; and Steinberg, Julius M., 3,895,984.

Steinhauer, Ernst Wilhelm; Fischer, Klaus; and Lower, Oskar, to Steinhauer, Ernst Wilhelm. Method for completely filling a cavity in a concrete structure. 3,895,472, Cl. 52-743.000.

Steinke, Leo, to Robert Bosch G.m.b.H. Ignition contact breaker system for internal combustion engine. 3,895,616, Cl. 123-117.00A.

Stella, Joseph A.; Burke, Edward F., Jr.; and Mason, Paul B., to Polaroid Corporation. Processing fluid release device and method for multipurpose film cassettes. 3,895,862, Cl. 352-130.000.

Stephen, John F., to Ciba-Geigy Corporation. 3,5-Dialkyl-4-Hydroxyphenylalkyl substituted tricyclic imides. 3,896,146, Cl. 260-326.00C.

Stephen, John F., to Ciba-Geigy Corporation. Hindered phenolic norbornane-2,3-dicarboximides. 3,896,147, Cl. 260-326.00C.

Stephenson, Robert L., to Allied Chemical Corporation. Vehicle passenger safety assembly. 3,895,823, Cl. 280-150.0AB.

Stern, Arthur M.: *See*—
Lange, K. Robert; Stern, Arthur M.; Gasner, Lawrence L.; and Hsu, Yuan Tsun, 3,895,996.

Stoll, Kurt; and Hihn, Gerhard. Valves. 3,895,648, Cl. 137-550.000.

Stoltman, Donald D., to General Motors Corporation. Hydraulic servomotor. 3,895,563, Cl. 91-384.000.

Stolzer, Paul, to Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Apparatus for feeding rod-shaped stock. 3,895,723, Cl. 214-1.00P.

Stone, Stanley Allan, to Scientific Systems, Inc. Automatic liquid sampling devise. 3,895,534, Cl. 73-422.00R.

Stone, Thomas W., to Ventrola Manufacturing Company. Ventilator. 3,895,568, Cl. 98-43.000.

Stores, Robert D.: *See*—
Perrott, Lloyd J.; and Stores, Robert D., 3,895,496.

Strasser, Georg, to Wild Heerbrugg Aktiengesellschaft. Electronic tachymeter. 3,895,871, Cl. 356-4.000.

Streed, Ramer W., to Sencore, Inc. Circuit for generating a stereo pilot signal. 3,896,268, Cl. 179-15.0BT.

Street, Graham Stewart Brandon. Light-beam steering apparatus. 3,896,362, Cl. 318-640.000.

Strenge, Gert: *See*—
Buschbaum, Edwin; Motschmann, Siegfried; and Strenge, Gert, 3,896,012.

Stroh, Anton; and Gollwitzer, Leonhard, to Wacker-Chemie GmbH. Diorganopolysiloxane-based lubricant for organic fibers. 3,896,032, Cl. 252-8.600.

Strutz, Hans-Jurgen; Jacob, Ingolf; and Seelig, Johann, to Hoechst Aktiengesellschaft. Process for crimping filaments and yarns. 3,895,420, Cl. 28-72.140.

Struwe, Burckhard: *See*—
Seiffert, Ulrich; and Struwe, Burckhard, 3,895,822.

Sturgeon, John Royal, to Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The. Aircraft instrumentation displays. 3,895,528, Cl. 73-178.00R.

Sturtevant Engineering Co., Limited: *See*—
Powning, Leslie George, 3,895,744.

Sueishi, Motoharu: *See*—
Endo, Kunio; Kawarada, Junji; Sueishi, Motoharu; Harada, Susumu; and Norimatsu, Hideaki, 3,895,611.

Suffolk Lawn Mowers Limited: *See*—
Olney, Norman Seth; and Dickinson, Timothy, 3,895,481.

Suga, Yozo: *See*—
Watanabe, Shozo; Tanaka, Kiyoshi; and Suga, Yozo, 3,895,974.

Sugawara, Kiyoshi, to Rank Xerox, Ltd. Toner level detector assembly including magnetically responsive switch actuated by differential loaded blade type rotor carrying magnetic actuator. 3,896,279, Cl. 200-61.210.

Sugita, Kouji: *See*—
Tanzawa, Hiroshi; Sakai, Yoshitada; Matsushita, Takao; Fujii, Yoshishige; Sugita, Kouji; and Maekawa, Haruki, 3,896,061.

Sujdak, Thomas J.; and Anderson, Douglas W., to Rockwell International Corporation. Harness frame for looms. 3,895,655, Cl. 139-92.000.

Sumita, Makoto: *See*—
Mabuchi, Shunsuke; Tsuzuki, Kenji; Matsunaga, Hideaki; Shimizu, Sadami; and Sumita, Makoto, 3,896,051.

Sumitomo Bakelite Company, Limited: *See*—
Watanabe, Tsutomu; Yamaoka, Shigenori; and Tanaka, Koichi, 3,896,076.

Summa Corporation: *See*—
Johnson, Lavell R., 3,896,217.

Summers, Leo Ewart Arthur; Le Cornu-Rickard, John Fyfe; and Underhill, David Sidney, to British Aircraft Corporation Limited. Forming metals. 3,895,436, Cl. 228-157.000.

Survival Technology, Inc.: *See*—
Bartner, Elliot; Curley, Edward M.; Kaplan, Sheldon; and Sarnoff, Stanley J., 3,895,633.

Sutton, Blaine M., to SmithKline Corporation. Pharmaceutical composition and method employing phenylvulpinic acid derivatives. 3,896,234, Cl. 424-279.000.

Suwyn, Mark A.: *See*—
Goodman, Albert; and Suwyn, Mark A., 3,896,204.

Suzaki, Kuniyoshi, to Canon Kabushiki Kaisha. Power transmission device between a plural number of rotors of cineprojectors. 3,895,544, Cl. 74-242.15R.

Suzuka, Susumu: *See*—
Ozutsumi, Minoru; Miyazawa, Yoshihide; and Suzuka, Susumu, 3,896,116.

Suzuki, Kunio, to Nippon Gakki Seizo Kabushiki Kaisha. Method of manufacturing a thin sheet of beryllium or an alloy thereof. 3,895,671, Cl. 164-46.000.

Suzuki, Yoshio: *See*—
Takahashi, Hidehiko; Suzuki, Yoshio; and Kinoshita, Tuyoshi, 3,896,127.

Swartz, Elmer L., to United States of America, Army. Apparatus for contour and linear measurement using fluids. 3,895,516, Cl. 73-37.600.

Swartz, Elmer L., to United States of America, Army. Fluidic flame detector. 3,895,901, Cl. 431-77.000.

Swartz, Richard L.: *See*—
Dillard, John W.; Tringali, Dominick; Swartz, Richard L.; and Hinson, Ernest M., Jr., 3,896,300.

Swearingen, Judson S. Thrust bearing lubricant measurement and balance. 3,895,689, Cl. 184-6.400.

Swearingen, Judson S., to United States of America, Energy Research and Development Administration. Mechanically actuated temporary pump shaft maintenance seal. 3,895,810, Cl. 277-9.0SR.

Swered, Paul: *See*—
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,896,231.
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,896,236.

Swett, James B., to Dart Industries Inc. Press type closure with double seal. 3,895,736, Cl. 220-306.000.

Swiss Aluminium Ltd.: *See*—
Weber, Herbert; and Wagner, Alfred, 3,895,899.

Sybron Corporation: *See*—
Metzger, Paul T.; and Mitchell, Wayne D., 3,895,543.

Syndyne Corporation: *See*—
Hayden, Julian D., 3,896,283.

Syntex Corporation: *See*—
Fried, John H.; and Harrison, Ian T., 3,896,157.

Syntex (U.S.A.) Inc.: *See*—
Berkoz, Belig M.; Edwards, John A.; and Fried, John H., 3,896,139.

Szabo, Alexander, to Canadian Patents and Development Limited. Frequency selective optical memory. 3,896,420, Cl. 340-173.0CC.

Szeverenyi, Nikolaus A.: *See*—
Peltz, John R.; and Szeverenyi, Nikolaus A., 3,896,424.

Szurszewski, Dolores. Chair seat adapter. 3,895,840, Cl. 297-230.000.

Taguchi, Tatsuya; and Iura, Yukio, to Canon Kabushiki Kaisha. Exposure value correcting device in an interchangeable lens camera provided with a TTL exposure meter. 3,896,462, Cl. 354-46.000.

Takahashi, Hidehiko; Suzuki, Yoshio; and Kinoshita, Tuyoshi, to Nippon Chemiphar Co., Ltd. Theophylline derivatives. 3,896,127, Cl. 260-256.000.

Takahashi, Nobukai; Iwasaki, Yoshiki; Kasuga, Masao; and Itoh, Yasuo, to Victor Company of Japan, Ltd. Muting system in multichannel disc reproducing apparatus. 3,896,272, Cl. 179-100.4ST.

Takahashi, Noriyuki; Miyahara, Hiromitsu; and Inoue, Hidehiko, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle-attitude control device. 3,895,816, Cl. 280-6.00H.

Takahashi, Noriyuki; Miyahara, Hiromitsu; and Inoue, Hidehiko, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle-height control device. 3,895,820, Cl. 280-124.00F.

Takahashi, Yasunobu; Seko, Maomi; Ide, Akira; Matumoto, Soziro; and Nishigaki, Takashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing aliphatic polyisocyanates. 3,896,154, Cl. 260-453.00P.

Takatsu, Ikue: *See*—
Yoshida, Akitoshi; Asahara, Koichi; Yanagida, Koichiro; Maruyama, Tadanobu; Takatsu, Ikue; and Kumagai, Yoshiko, 3,895,956.

Takeda, Yuji: *See*—
Sawada, Daisaku; and Takeda, Yuji, 3,896,322.

Takeshi, Nakane; and Naoji, Sakakibara, to Aisin Seiki Kabushiki Kaisha. Electronic speed control system for vehicles. 3,895,684, Cl. 180-105.00E.

Takeuchi, Shiegeo, to Takeuchi Tekko Kabushiki Kaisha. Apparatus for applying wax to the surfaces of vehicles. 3,895,601, Cl. 118-8.000.

Takeuchi Tekko Kabushiki Kaisha: *See—*
Takeuchi, Shiegeo, 3,895,601.

Takigawa, Tomoshi; and Komine, Yoshio, to Canon Kabushiki Kaisha. Camera using a film magazine. 3,896,465, Cl. 354-174.000.

Takigawa, Tomoshi: *See—*
Hashimoto, Teiji; Takigawa, Tomoshi; and Ichiyanagi, Toshikazu, 3,895,863.

Tamura, Teizo, to Hitachi, Ltd. Air bearing head support device for multi-channel disc memory apparatus. 3,896,494, Cl. 360-103.000.

Tanaka, Akio: *See—*
Noda, Akira; Wakako, Atsuhiro; Kodashima, Tadashi; and Tanaka, Akio, 3,895,549.

Tanaka, Kenji: *See—*
Iijima, Yasuo; and Tanaka, Kenji, 3,895,535.

Tanaka, Kiyoshi: *See—*
Watanabe, Shozo; Tanaka, Kiyoshi; and Suga, Yozo, 3,895,974.

Tanaka, Koichi: *See—*
Watanabe, Tsutomu; Yamaoka, Shigenori; and Tanaka, Koichi, 3,896,076.

Tangorra, Giorgio, to Industrie Pirelli, S.p.A. Pneumatic wheel. 3,895,668, Cl. 152-379.000.

Tanikoshi, Kinji, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Driving system for DC motors with hall generators. 3,896,357, Cl. 318-254.000.

Tanikoshi, Kinji, to Canon Seiki Kabushiki Kaisha; and Canon Kabushiki Kaisha. Synchronous drive system for a D.C. motor. 3,896,358, Cl. 318-314.000.

Tanzawa, Hiroshi; Sakai, Yoshitada; Matsushita, Takao; Fujii, Yoshishige; Sugita, Kouji; and Maekawa, Haruki, to Toray Industries, Inc. Semi-permeable membranes, their preparation and their use. 3,896,061, Cl. 260-2.50M.

Tarkan, Stuart E.: *See—*
Ellis, John L.; Mal, M. Kumar; and Tarkan, Stuart E., 3,896,244.

Tarui, Yasuo; Hayashi, Yutaka; and Sekigawa, Toshihiro, to Kogyo Gijutsuin. Method of manufacturing transistors. 3,895,978, Cl. 148-187.000.

Tatewaki, Shoichi: *See—*
Yoshida, Fumio; Sakamoto, Setsuo; and Tatewaki, Shoichi, 3,895,859.

Tatge, Robert B.: *See—*
Savkar, Sudhir D.; Giles, Walter B.; and Tatge, Robert B., 3,895,686.

Taylor, Allen L.; and McFadden, Francis J., to Minnesota Mining and Manufacturing Company. Pyroelectric motion and temperature sensitive infrared detector with conductive fingers. 3,896,311, Cl. 250-342.000.

Technological Supply S.A.: *See—*
Plowiecki, Leopold, 3,895,632.

Tedder, Paul M., deceased; and by Tedder, Yvonne M., administrator, to United States of America, Army. Band pass integrator for proximity fuses. 3,895,580, Cl. 102-70.20P.

Tedder, Yvonne M., administrator: *See—*
Tedder, Paul M., deceased; and Tedder, Yvonne M., administrator, 3,895,580.

Teledyne, Inc.: *See—*
Mather, Richard E., 3,896,469.

Tennant Company: *See—*
Delmore, Daniel A., 3,895,511.

Terkelsen, Bruce E.: *See—*
King, Robert E., Jr.; and Terkelsen, Bruce E., 3,895,672.

Terrell, Herschel D., Jr.: *See—*
Thompson, Homer T.; and Terrell, Herschel D., Jr., 3,895,724.

Terrell, Ross C., to Airco, Inc. 1-Chloro-1-Hydroperfluoropropyl difluoromethyl ether. 3,896,177, Cl. 260-614.00F.

Terrell, Ross C., to Airco, Inc. Inhalant anesthetic compositions and method. 3,896,178, Cl. 260-614.00F.

Terum, Trygve Olavson: *See—*
Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, 3,895,937.

Tesch, Guenter Horst, to Breveteam S.A. Textile bottom floor cover having at least one reinforcing strip and method of production thereof. 3,895,981, Cl. 156-71.000.

Tesler, Vladimir Efimovich. Compatible stereoscopic color television system. 3,896,487, Cl. 358-3.000.

Texaco, Inc.: *See—*
Coleman, Richard L.; Cummins, Billy H.; and Startz, Ambrose J., 3,896,025.
Dancy, Julian H., 3,896,340.
Dowling, Donald J.; and Boyd, John F., 3,896,413.
MacLean, John P.; Bunn, Dorrance P.; and Mager, Adolph S., 3,896,026.
Schlicht, Raymond C.; and Eckert, George W., 3,895,925.
White, James A., 3,896,050.
Yamamoto, Roy Isamu; and Saines, George S., 3,896,074.

Texas Instruments Incorporated: *See—*
Brown, Max W., 3,896,418.
de Wit, Michiel; and Hotz, Roddy Fro, 3,896,397.
Schreiner, Max P.; and Hyltin, Tom M., 3,896,336.
Wakefield, Gene F., 3,895,923.

Textron Inc.: *See—*
Bauer, William H., 3,895,746.

Th. Goldschmidt AG: *See—*
Holtschmidt, Ulrich; and Schwarzmann, Gunter, 3,896,171.

Thermo Electron Corporation: *See—*
Fraim, Freeman W.; and Murphy, Preston V., 3,896,274.
Sakhuja, Ravinder K., 3,895,608.

Thermotics, Inc.: *See—*
Newman, Jacques, 3,896,214.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Method and apparatus for tamping and leveling track. 3,895,583, Cl. 104-12.000.

Thevenaz, Jean. Film-spool drive in cinematographic equipment. 3,895,766, Cl. 242-205.000.

Theysohn, Helmuth. Flat sheet injection head for roller-head installations. 3,895,898, Cl. 425-325.000.

Thiessen, Leo K., to Certain-Teed Products Corporation. Flange connector assembly for grooved pipe. 3,895,833, Cl. 285-413.000.

Thiokol Corporation: *See—*
Shaw, Graham C.; and Reed, Russell, Jr., 3,895,578.

Thoden, John, to Kontes Glass Company. Spotter for use in thin layer chromatography. 3,895,758, Cl. 239-296.000.

Thomas, Gareth J.: *See—*
Kupchan, S. Morris; Komoda, Yasuo; Thomas, Gareth J.; and Court, William A., 3,896,111.

Thomas, Lindsay Maitland, to Fairey Stainless Limited. Thin-walled containers. 3,895,734, Cl. 220-5.00R.

Thompson, Edward J.: *See—*
Lockwood, Robert J.; Reymore, Harold E., Jr.; and Thompson, Edward J., 3,896,052.

Thompson, Homer T.; and Terrell, Herschel D., Jr. Gravity type drum rack with an unloading mechanism. 3,895,724, Cl. 214-16.40R.

Thompson, James Thomas: *See—*
Seto, Kenneth Hon; and Thompson, James Thomas, 3,896,245.

Thomson-CSF: *See—*
Baro, Jose Marie, 3,896,394.
Bobenrieth, Albert, 3,895,602.
Carre, Roland, 3,896,433.
Galves, Jean Pierre; and Reboul, Jean Philippe, 3,896,324.
Henry, Raymond, 3,896,478.
Ostrowsky, Daniel; Reiber, Louis Marcel; and Poirier, Raymond, 3,896,305.
Sirven, Jacques, 3,896,434.

Thomson, Ian M., to Enersorb Limited. Energy absorbing devices. 3,895,835, Cl. 293-71.00R.

Thomson, Ronald E.; and Kast, Philip J., to Madison-Kipp Corporation. Lubricator assembly with automatic reset. 3,895,690, Cl. 184-15.00A.

Thorngate, John H.: *See—*
Becker, Klaus H.; Haywood, Fred F.; Perdue, Philip T.; and Thorngate, John H., 3,896,306.

Ticknor, Leland B.: *See—*
Harder, Richard E.; and Ticknor, Leland B., 3,895,908.

Tiedeman, George T.: *See—*
Baxter, Gene F.; Freeman, Harlan G.; and Tiedeman, George T., 3,896,081.

Tiemann, Theodor: *See—*
Greive, Aloys; and Tiemann, Theodor, 3,895,484.

Tilles, Harry, to Stauffer Chemical Company. Method of making carbamoyl sulfoxide derivatives. 3,896,168, Cl. 260-551.00R.

Tilles, Harry; and Casida, John E., to Stauffer Chemical Company. Method of making carbonoyl sulfoxide derivatives. 3,896,169, Cl. 260-551.00R.

Timesavers, Inc.: *See—*
Kiser, Fred W., 3,895,464.

Timex Corporation: *See—*
Barth, Manfred; and Meitinger, Heinz, 3,895,487.

Tkachenko, Arkady Semenovich: *See—*
Kozhevnikov, Sergei Nikolaevich; Tkachenko, Arkady Semenovich; and Fedorovsky, Eduard Fedorovich, 3,895,510.

Toda, Soichiro: *See—*
Naito, Takayuki; Nakagawa, Susumu; and Toda, Soichiro, 3,896,106.

Toepell, Hans D. Process for reducing iron oxides in rotary kiln. 3,895,936, Cl. 75-29.000.

Tokuno, Masateru, to Rengo Co., Ltd. Method and apparatus for splicing paper rolls. 3,895,763, Cl. 242-58.300.

Tokyo Printing Ink Mfg. Co., Ltd.: *See—*
Koishi, Hitoshi; and Ishida, Yoshihiro, 3,896,064.

Tokyo Shibaura Electric Company, Ltd.: *See—*
Kodama, Koji, 3,896,341.
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Tolkoff, Marc Joshua: *See—*
Dennison, Allan G.; Bancroft, Martha F.; Smith, Stanley B., Jr.; and Tolkoff, Marc Joshua, 3,895,873.

Tomarelli, Rudolph M.: *See—*
Santilli, Arthur A.; Scotese, Anthony C.; and Tomarelli, Rudolph M., 3,896,129.

Tomasch, Helmut: *See—*
Bechstein, Herbert; Jaenke, Hans-Jurgen; Muller, Rolf; Ritter, Ernst; Staudt, Heinrich; Tomasch, Helmut; and Urlberger, Alois, 3,895,537.

Tominaga, Sinji: *See—*
Sahara, Masayoshi; and Tominaga, Sinji, 3,896,460.

Toray Industries, Inc.: *See—*
Tanzawa, Hiroshi; Sakai, Yoshitada; Matsushita, Takao; Fujii, Yoshishige; Sugita, Kouji; and Maekawa, Haruki, 3,896,061.

Tord, Pierre Francois: *See—*
Mayor, Yoland Pierre Paul; and Tord, Pierre Francois, 3,896,211.

Torrington Company, The: *See—*
Woodilla, John E., Jr.; Hunt, Gordon W.; and Green, Willard B., Jr., 3,895,972.

Townsley, Malcolm G., to Wesley-Jessen Inc. Method for comparing corneal measurements. 3,895,860, Cl. 351-39.000.

Toyama Chemical Co., Ltd.: *See—*
Ishimaru, Toshiyasu; and Kodama, Yutaka, 3,896,118.

Toyo Rubber Industry Co., Ltd., The: *See—*
Inoue, Teruo, 3,895,666.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yujiro; Uemura, Masaru; Fujiki, Tokio; Kimura, Masatoshi; and Saito, Mitsutaka, 3,896,067.
Kosaka, Yujiro; Kuroki, Hitoshi; Echida, Nobuhiro; Otomo, Kanji; and Uemura, Masaru, 3,896,069.
Mabuchi, Shunsuke; Tsuzuki, Kenji; Matsunaga, Hideaki; Shimizu, Sadami; and Sumita, Makoto, 3,896,051.

Toyoda, Kenji, to Nippon Kogaku K.K. Electronic shutter with memory function. 3,896,456, Cl. 354-24.000.

Toyoda-Koki Kabushiki Kaisha: *See—*
Nakao, Hisaji; Kurosaka, Akira; Otani, Katsunori; Tsuzuki, Sadaaki; and Honda, Yuzo, 3,895,427.

Toyoda, Yasushi; and Kashio, Hidetora, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing vinylidene chloride/vinyl chloride copolymers. 3,896,063, Cl. 260-23.0XA.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nohira, Hidetaka; and Ito, Shin, 3,895,541.
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Trecker, David John: *See—*
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Persson, Bo Klas Gerhard, 3,895,982.

Tri-tech, Inc.: *See—*
Haydon, Arthur W., 3,896,298.

Trikilis, Emmanuel M. Magnetic sensing detection system and method. 3,896,372, Cl. 324-41.000.

Tringali, Dominick: *See—*
Dillard, John W.; Tringali, Dominick; Swartz, Richard L.; and Hinson, Ernest M., Jr., 3,896,300.

Trolliet, Philippe, to Canada, Her Majesty the Queen in Right of, as represented by the Secretary of State. System for monitoring and indicating peak values of a time varying signal. 3,896,375, Cl. 324-103.00P.

Trowe, Neil M., to Wheeler International Inc. Method for automatic differential leukocyte count. 3,896,307, Cl. 250-304.000.

TRW Inc.: *See—*
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Tsujimoto, Kayoshi: *See—*
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Tsygankin, Nikolai Ivanovich: *See—*
Levin, Solomon Isaakovich; Samonov, Valentin Terentievich; Tsygankin, Nikolai Ivanovich; and Khoroneko, Nadezhda Serafimovna, 3,895,706.

Tulkoff, Martin J. Method of heat-shrink wrapping goods. 3,896,288, Cl. 53-30.000.

Tummler, Peter; and Zima, Herbert, to Vianova-Kunstharz A.G. Dispersion of cross-linkable acrylic resin with amino-aldehyde. 3,896,070, Cl. 260-29.4UA.

Tummler, Peter; and Zima, Herbert, to Vianova-Kunstharz A.G. Process of making aqueous co-polymer dispersion and dispersion therefor. 3,896,072, Cl. 260-29.6TA.

Turek & Heller Machine, Inc.: *See—*
Brandli, John R.; and Turek, Herbert, 3,895,463.

Turek, Herbert: *See—*
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Turner, Edward W.: *See—*
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Turner, John C.: *See—*
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Turner, Kenneth R.; and Bryanos, James C., to Raytheon Company. Method for electrically interconnecting multilevel stripline circuitry. 3,895,435, Cl. 29-625.000.

Tuttle, Carole K., to Dow Chemical Company, The. Process of metal plating on plastics. 3,896,252, Cl. 427-306.000.

Tuvell, Melvin E.: *See—*
Lindsay, Kenneth L.; Kuehnhanss, Gerhard O.; and Tuvell, Melvin E., 3,896,057.

Tyco Laboratories, Inc.: *See—*
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Uchidoi, Masanori; and Yamada, Tateo, to Canon Kabushiki Kaisha. Optical projector capable of random access and repeat projections. 3,895,864, Cl. 353-25.000.

Ueda, Hiroshi: *See—*
Yoshiyama, Ichiro; Tsujimoto, Kayoshi; and Ueda, Hiroshi, 3,896,472.

Ueki, Atsufumi, to Nippon Electric Company, Limited. Driver circuit for pulse modulation of a semiconductor laser. 3,896,398, Cl. 332-7.510.

Uelzmann, Heinz: *See—*
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Ugo, John W., to Uniroyal, Inc. Tire sorting apparatus. 3,895,716, Cl. 209-74.00M.

Ule, Louis A., to Electronic Camshaft Corporation. High speed electromagnet control circuit. 3,896,346, Cl. 317-154.000.

Umetani, Tomonobu: *See—*
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Umphrey, Ronald W., to Continental Oil Company. Turning conveyor for a flexible hose supporting system. 3,895,644, Cl. 137-344.000.

Underhill, David Sidney: *See—*
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Underhill, Robert A.: *See—*
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Union Carbide Corporation: *See—*
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Gerkin, Richard Michael; and Comstock, Lowell Ray, 3,896,303.
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Uniroyal, Inc.: *See—*
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United States Steel Corporation: *See—*
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University of California, The Regents of the: *See—*
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University of Missouri, The Curators of the: *See—*
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Urushibara, Yutaka. Handle for suitcases and the like having casters. 3,895,696, Cl. 190-58.000.

Usami, Hiroshi: *See—*
Inaba, Seiuemon; Shimizu, Kanryo; Hashimoto, Yoshihiro; Amemiya, Youichi; and Usami, Hiroshi, 3,896,361.

Utumi, Atushi; Fujiwara, Yasuaki; Asai, Akira; and Jitsukawa, Masao, to Dainichi Nippon Cable Co., Ltd. Process for producing a foamed polyolefin insulated conductor. 3,896,198, Cl. 264-45.900.

Vadas, Leslie, to FMC Corporation. Pineapple slitting and conveying. 3,896,243, Cl. 426-482.000.

Valoti, GianFranco; and Antonini, Giancarlo, to Societa' Italiana Resine S.I.R. S.p.A. Process for the production of polymers of acrylonitrile and styrene and of acrylonitrile, styrene, and butadiene. 3,896,093, Cl. 260-80.780.

van der Buylton-Domgraff, Ralph; and Doderer-Winkler, Alfred. Apparatus for delivering part quantities of foam stock. 3,895,740, Cl. 222-162.000.

Van De Voorde, Norbert L. C.: *See—*
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Van Essen, Willem Johannes: *See—*
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Vaportech Corporation: *See—*
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Vargiu, Silvio; Berti, Renato; and Pitzalis, Mario, to Societa' Italiana Resine S.I.R. S.p.A. Liquid hardeners for liquid epoxy resins, manufacturing method and use. 3,896,080, Cl. 260-47.0EN.

Varian Associates: *See—*
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Velsicol Chemical Corporation: *See—*
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Venables, John Anthony; Pollard, Peter John; and Griffiths, Barrie William, to National Research Development Corporation. Detector for electron microscopes. 3,896,308, Cl. 250-305.000.

Ventrola Manufacturing Company: *See—*
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Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
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Vetco Offshore Industries, Inc.: *See—*
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Vetter, Jochen, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Process and apparatus for the coating of an electrically conductive fibrous strand. 3,896,010, Cl. 204-28.000.

Vetter, Ronald F.; Miller, Ray A.; Panella, Edward A.; and Rosolanka, James J., to United States of America, Navy. Wing thruster. 3,895,515, Cl. 73-71.50R.

Vianova-Kunstharz A.G.: *See—*
Tummler, Peter; and Zima, Herbert, 3,896,070.
Tummler, Peter; and Zima, Herbert, 3,896,072.

Victor Company of Japan, Ltd.: *See—*
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Vignovich, Pete: *See—*
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Visser, Harry D.; and Nudenberg, Walter, to Uniroyal, Inc. Preparation of alpha-olefin copolymers with vanadium phosphorodithioate catalyst. 3,896,094, Cl. 260-80.780.

Visser, Harry D.; and Nudenberg, Walter, to Uniroyal, Inc. Molecular weight regulation of ethylene alpha-olefin copolymers. 3,896,096, Cl. 260-80.780.

Vittoz, Eric Andre: *See—*
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Volgyesy, Ivan L.: *See—*
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Volk, Anthony J. Retainer for dressed poultry. 3,895,415, Cl. 17-11.000.

Volkswagenwerk Aktiengesellschaft: *See—*
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Seiffert, Ulrich; and Struwe, Burckhard, 3,895,822.

von Beckmann, Helmuth, to Canron Inc. Ballast reaction rail clamps. 3,895,582, Cl. 104-12.000.

Voss, Hartwig: *See—*
Niehus, Gunther; and Voss, Hartwig, 3,895,787.

Voss, Robert A.; and Wohlford, Larry H., to General Electric Company. Intercom circuit for a radio transmitter and receiver. 3,896,379, Cl. 325-21.000.

Vulcan Tool Company: *See—*
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W. H. Brady Co.: *See—*
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Wagner, Frank Albert, Jr., to American Cyanamid Company. Preparation of 3,5-diphenyl-2-pyrazolin-4-ol, 3,5-diphenyl-pyrazole and the phenyl-substituted derivatives thereof. 3,896,144, Cl. 260-310.00R.

Wahl, Robert H. Rotary Nutating engine. 3,895,610, Cl. 123-8.450.

Wakako, Atsuhiro: *See—*
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Wakefield, Gene F., to Texas Instruments Incorporated. High strength metal carbonitrided composite article. 3,895,923, Cl. 29-191.000.

Wakefield, Lynn B.; Crane, Grant; and Kay, Edward Leo, to Firestone Tire & Rubber Company, The. Production of resins from solubilized scrap rubber, the resins thus produced and rubber compounds and products incorporating the resins. 3,896,059, Cl. 260-2.300.

Walden, Richard D. Tape storage container for automobiles. 3,895,848, Cl. 312-236.000.

Walker, Dennis E.: *See—*
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Walker, John H., to Phillips Petroleum Company. Printable antiblocking resinous block copolymer. 3,896,068, Cl. 260-28.50B.

Wall, Christopher; Scaife, Ronald; and Wood, Thomas A., to British Jeffrey-Diamond Limited. Road planing machine. 3,895,843, Cl. 299-39.000.

Wallace, John D.: *See—*
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Waller, Norbert. Apparatus for producing a knitted fabric with projecting barbs. 3,895,489, Cl. 66-91.000.

Waller, Siegfried: *See—*
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Walraven, Hank. Drain structure. 3,895,401, Cl. 4-198.000.

Walsh, Bernard L., Jr.: *See—*
Hudspeth, Thomas; Rosen, Harold A.; and Walsh, Bernard L., Jr., 3,896,262.

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Wasag Chemie: *See—*
Kraemer, Stefan; Seidl, Alois; and Reidl, Hans-Joachim, deceased, 3,895,979.

Wasserfaller, Georg. Door lock. 3,895,505, Cl. 70-111.000.

Wasserlein, Henry George, Jr., to AMP Incorporated. Slotted plate type electrical connections. 3,895,852, Cl. 339-99.00R.

Wat, Edward Koon Wah, to du Pont de Nemours, E. I., and Company. 6,7-Epoxygeranyl ethers of oxygen heterocyclic compounds. 3,896,115, Cl. 260-240.00R.

Watanabe, Hirotaka: *See—*
Okada, Katsuto; Ishibashi, Akichika; and Watanabe, Hirotaka, 3,895,651.

Watanabe, Shozo; Tanaka, Kiyoshi; and Suga, Yozo, to Nippon Steel Corporation. Process for producing a grain-oriented electrical steel sheet having excellent magnetic characteristic. 3,895,974, Cl. 148-111.000.

Watanabe, Tsutomu; Yamaoka, Shigenori; and Tanaka, Koichi, to Sumitomo Bakelite Company, Limited. Adhesive composition for flexible printed circuit and method for using the same. 3,896,076, Cl. 260-40.00R.

Watarai, Syu; and Seoka, Yoshio, to Rank Xerox, Ltd. Process for preparation of a dyestuff sensitized photoconductive composition. 3,895,945, Cl. 96-1.600.

Waterbury, Nelson J. Credit and other security cards and card utilization systems therefore. 3,896,266, Cl. 179-1.0SB.

Waugh Control Corporation: *See—*
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Webb, Byron K.: *See—*
Garner, Thomas H.; and Webb, Byron K., 3,895,589.

Weber, Herbert; and Wagner, Alfred, to Swiss Aluminium Ltd. Extrusion die. 3,895,899, Cl. 425-378.00R.

Weil, Edward D., to Stauffer Chemical Company. Poly(haloethylethyleneoxy) phosphoric acid ester polymers. 3,896,187, Cl. 260-928.000.

Weil, Edward D.: *See*—
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Well Control, Inc.: *See*—
Bournham, Gerald E., Sr., 3,895,927.

Welzel, Gunter; and Ajmaletdinov, Dair. Bearing means for automatic shed loom. 3,895,654, Cl. 139-12.000.

Weman, Per Olaf; and Schmelow, Harald Martin, to Sigmatex A.G. Locking pawl and ratchet wheel. 3,895,539, Cl. 74-575.000.

Werner, Claus: *See*—
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Wesley-Jessen Inc.: *See*—
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West, Charles W.: *See*—
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Western Electric Company, Incorporated: *See*—
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Weyerhaeuser Company: *See*—
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Wheeler International Inc.: *See*—
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Wheeler, Myron S., to Westinghouse Electric Corporation. Retrodirective passive beacon for simulating a moving target. 3,896,440, Cl. 343-18.00D.

Whelan, Maurice Vincent, to U.S. Philips Corporation. Switch. 3,896,483, Cl. 357-23.000.

Whirlpool Corporation: *See*—
Barton, Ralph D.; and Buchser, William J., 3,895,500.

White, James A., to Texaco Inc. Lubricating oil additives. 3,896,050, Cl. 252-47.500.

White, Roger B.; Pearson, David E.; and Birkner, Hugo E., Jr., to Pultrusions Corporation, The. Apparatus for pultruding hollow objects. 3,895,896, Cl. 425-93.000.

Whitehouse, David R.; and Hartshorn, David W., to Raytheon Company. Laser power supply. 3,896,396, Cl. 331-94.5PE.

Whiteside, George D.: *See*—
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Whitney, George Joseph, to Lucas Electrical Company Limited. Automotive spot lamps. 3,896,302, Cl. 240-41.00R.

Whittaker Corporation: *See*—
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Wiedeman, Charles W., to Singer Company, The. Card reader mechanism. 3,896,291, Cl. 235-61.11R.

Wiedemann, Wolfgang; and Zimmer, Horst, to Hoechst Aktiengesellschaft. Electrophotographic recording material having a layered structure of charge generating and charge transport layers. 3,895,944, Cl. 96-1.500.

Wild Heerbrugg Aktiengesellschaft: *See*—
Strasser, Georg, 3,895,871.

Wild, Jost: *See*—
Helmlinger, Daniel; Lamparsky, Dietmar; Schudel, Peter; Wild, Jost; and Sigg-Grutter, Trudi, 3,896,175.

Wild, Peter: *See*—
de Quervain, Alfred; and Wild, Peter, 3,895,866.

Wiley, Fred E.; and Turner, Edward W., to Phillips Petroleum Company. Method of molding biaxially oriented hollow articles. 3,896,200, Cl. 264-89.000.

Wilkins, James A., Jr. Brake controlled throttle holding means for vehicle. 3,895,697, Cl. 192-3.00T.

Willems, Henricus Gerardus Antonius, to U.S. Philips Corporation. Discharge tube containing mercury. 3,896,325, Cl. 313-218.000.

Willenbrock, Helmut; and Schittek, Friedrich, to Gustav F. Gerdts KG. Valve. 3,895,647, Cl. 137-529.000.

Willetts, Elwood H. Railraod car supsension system. 3,895,586, Cl. 105-224.100.

Willetts, Elwood H. Single axle suspension system. 3,895,819, Cl. 280-124.00R.

Williams, Billy C.: *See*—
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Williams, Robert C., to GTE Information Systems Incorporated. Display apparatus with selective character width multiplication. 3,896,428, Cl. 340-324.0AD.

Wilson Greatbatch Ltd.: *See*—
Mead, Ralph T., 3,895,962.

Wilson Industries, Inc.: *See*—
Barnes, Willard, 3,895,837.

Wilson, James, to Bell Telephone Laboratories, Incorporated. Telephone line switch. 3,896,275, Cl. 179-158.00R.

Wilson and Longbottom Limited: *See*—
Allsopp, Peter Stockport, 3,895,656.

Wilson, Nathan R. Bed making apparatus. 3,895,404, Cl. 5-334.00R.

Wilson, Ronald H.; Gibbons, Martin D.; and Blumenfeld, Samuel M., to General Electric Company. Method for reducing blooming in semiconductor array targets. 3,895,430, Cl. 29-584.000.

Wiretech Corporation: *See*—
Fletcher, Ralph P., Jr.; and Pratt, Ted C., 3,895,762.

Wise, David L.: *See*—
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Wisniewski, Judith L.: *See*—
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Wohlford, Larry H.: *See*—
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Wolf, Klaus: *See*—
Cappel, Bert; Schuhmann, Siegfried; and Wolf, Klaus, 3,895,575.

Wolfelsperger, Robert O., to Young, William E. Method and apparatus for vacuum skin packaging of soft meat and the like. 3,895,475, Cl. 53-22.00A.

Wolff, Vernon Clare, Jr.: *See*—
Reardon, Joseph Edward; and Wolff, Vernon Clare, Jr., 3,896,065.

Wolski, Adam M., to Yates Industries, Inc. Process for improving the solderability of a stainproofed copper surface and product. 3,896,256, Cl. 428-457.000.

Wong, Bing Lou: *See*—
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Wood, Thomas A.: *See*—
Wall, Christopher; Scaife, Ronald; and Wood, Thomas A., 3,895,843.

Woodilla, John E., Jr.; Hunt, Gordon W.; and Green, Willard B., Jr., to Torrington Company, The. Thermal treatment of steel. 3,895,972, Cl. 148-12.100.

Wozencraft, John M., to United States of America, Army. Reliable radio-teletype coding. 3,896,381, Cl. 325-32.000.

Wright, Charles L.; and Williams, Billy C., to Dresser Industries, Inc. Sealer ball catcher and method of use thereof. 3,895,678, Cl. 166-284.000.

Wright, Jerome Edward, to RCA Corporation. Power transistor having good thermal fatigue capabilities. 3,896,486, Cl. 357-67.000.

Wright, John S. Accessory storage and projection apparatus for visual communications. 3,895,453, Cl. 40-102.000.

Wulbern, Herman, to Melet Plastics Ltd. Collapsible container. 3,895,742, Cl. 222-105.000.

Wurth, Reinhold. Strut for interconnecting reinforcement rods. 3,895,470, Cl. 52-686.000.

Xerox Corporation: *See*—
Bergfjord, John Alf; Radler, Richard William; and Millonzi, Richard Phillip, 3,896,184.
Bigenwald, John J., 3,895,793.
Hoyer, August; and Nekula, Ronald M., 3,895,790.
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Yaginuma, Jusuke, to Copal Company Limited. Time switch mechanism with automatic and/or manual actuating assembly. 3,896,277, Cl. 200-38.00R.

Yamada Dobby Co., Ltd.: *See*—
Koyama, Akira, 3,895,653.
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Yamada, Seiji: *See*—
Kitaura, Mashio; Yata, Koutaro; and Yamada, Seiji, 3,895,875.

Yamada, Tateo: *See*—
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Yamaguchi, Hiroji; and Ogasahara, Tunehiko. Transfer transmission mechanism. 3,895,546, Cl. 74-695.000.

Yamamoto, Nobuo: *See*—
Shiba, Keisuke; Kubodera, Seiiti; Ohi, Reiichi; Shishido, Tadao; Yamamoto, Nobuo; and Sakai, Takeo, 3,895,948.

Yamamoto, Roy Isamu; and Saines, George S., to Texaco, Inc. Alkylacrylate-alkanediol methacrylate interpolymers and pour depressed compositions thereof. 3,896,074, Cl. 260-80.810.

Yamamoto, Toyohiko: *See*—
Kondo, Marekata; Fukuda, Seiwa; and Yamamoto, Toyohiko, 3,895,955.

Yamane, Mamoru: *See*—
Ozaki, Hiromi; Yamane, Mamoru; and Yoshikai, Haruo, 3,896,023.

Yamanishi, Akio; and Yamazaki, Yasuo, to Minolta Camera Kabushiki Kaisha. Automatic focusing device. 3,896,457, Cl. 354-25.000.

Yamaoka, Shigenori: *See*—
Watanabe, Tsutomu; Yamaoka, Shigenori; and Tanaka, Koichi, 3,896,076.

Yamashita, Kameshiro, to Kabushiki Kaisha Seikosha. Apparatus for advancing and positioning articles. 3,895,477, Cl. 53-59.00R.

Yamatake-Honeywell Company Limited: *See*—
Onogi, Seiji, 3,896,366.

Yamazaki, Yasuo: *See*—
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Yoshida, Akitoshi; Asahara, Koichi; Yanagida, Koichiro; Maruyama, Tadanobu; Takatsu, Ikue; and Kumagai, Yoshiko, 3,895,956.

Yano, Takeshi; Futami, Takehiro; and Ookura, Mototsugu, to Nippon Electric Company, Limited. Electromechanical filter comprising electromechanical resonators at least one of which has different input and output equivalent inductances. 3,896,401, Cl. 333-72.000.

Yardley, John P.: *See*—
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Yata, Koutaro: *See*—
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Yates Industries, Inc.: *See*—
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Yeasting, Maynard C., to Reliance Electric and Engineering Company, The. Elevator control. 3,895,692, Cl. 187-29.000.
Yokota, Yuzo: *See*—
Akamatsu, Kiyoshi; Yokota, Yuzo; Sagami, Hiroshi; and Imai, Isao, 3,895,949.
Yonemitsu, Eiichi; Kamiyama, Seiichi; Kanada, Toshiaki; and Nagai, Norio, to Mitsubishi Gas Chemical Company, Inc. Flame resistant molding resin composition. 3,896,185, Cl. 260-873.000.
Yoshida, Akitoshi; Asahara, Koichi; Yanagida, Koichiro; Maruyama, Tadanobu; Takatsu, Ikue; and Kumagai, Yoshiko, to Nissan Chemical Industries, Ltd. Water permeability reducing inorganic coating slurry composition. 3,895,956, Cl. 106-193.00R.
Yoshida, Fumio; Sakamoto, Setsuo; and Tatewaki, Shoichi, to Nissan Motor Company Limited; and Central Glass Company Limited. Glare-reducing window pane and automotive window arrangement using the pane. 3,895,859, Cl. 350-276.00R.
Yoshida, Isamu; and Hayasaka, Toshimi, to Olympus Optical Co., Ltd. Weight balancing mechanism for use in precision elevating and lowering means. 3,895,770, Cl. 248-123.000.
Yoshida Kogyo Kabushiki Kaisha: *See*—
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Yoshikai, Haruo: *See*—
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Yoshiyama, Ichiro; Tsujimoto, Kayoshi; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Automatic exposure control device for use in a photographic camera. 3,896,472, Cl. 354-29.000.
Young, David W. Perspective radar airport recognition and landing guidance system. 3,896,432, Cl. 343-5.0LS.
Young, Donald Peter, to BP Chemicals Limited. Process for preparing vinyl chloride by the pyrolysis of 1,2-Dichloro-ethane. 3,896,182, Cl. 260-656.00R.
Young, Richard K., to Phillips Petroleum Company. Heat exchanger distributor. 3,895,676, Cl. 165-167.000.
Young, Robert Cleland: *See*—
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Young, William E.: *See*—
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Yum, Su Il: *See*—
Buckles, Richard G.; Hoff, Seymour; Kehr, Sharon; and Yum, Su Il, 3,895,631.
Zach, Roger G. Diametrically expansible coil spring conduit plug. 3,895,652, Cl. 138-89.000.
Zax, Grigory Iosifovich: *See*—
Anikanov, Nikolai Ivanovich; Baburin, Evgeny Arkadievich; Grachev, Leonid Pavlovich; Zax, Grigory Iosifovich; Frumkin, Mikhail Evseevich; Radutsky, Grigory Avramovich; and Kheifets, Rafail Efimovich, 3,895,566.
Zebree, David T., to Hercules Incorporated. Long burning delay blasting caps. 3,895,577, Cl. 102-29.000.
Zedgenidze, Tengiz Grigorievich: *See*—
Arakelov, Mikhail Alexandrovich; Gersamia, Eduard Galaktionovich; Zedgenidze, Tengiz Grigorievich; and Nozadze, Gennady Pavlovich, 3,895,423.
Zehr, William J., to Protectoseal Company, The. Automatic door closure for storage cabinets. 3,895,849, Cl. 312-324.000.
Zelby, Leon W., to Stein, Paul D., a part interest. Method and apparatus for determining cross-sectional area of a blood conduit and volumetric flow therethrough. 3,896,373, Cl. 324-57.00R.
Zenith Radio Corporation: *See*—
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Sedivy, Stanley J., 3,896,321.
Zenith Time S.A.: *See*—
Gerber, Jean-Pierre; and Feller, Rudolf, 3,895,485.
Zewi, Gabriel: *See*—
Alberty, Joachim; Salomaa, Eero; Saris, Nils-Erik; Sjostrom, Eero; and Zewi, Gabriel, 3,895,914.
Zievers, James F., to Industrial Filter and Pump Mfg. Co. Process for removing metallic ions from an electrolytic solution. 3,896,013, Cl. 204-149.000.
Ziffer, Garret Francis, to Coulter Electronics, Inc. Chromatic method and apparatus for conducting microscopic examinations at a plurality of magnifications. 3,895,854, Cl. 350-20.000.
Zima, Herbert: *See*—
Tummler, Peter; and Zima, Herbert, 3,896,070.
Tummler, Peter; and Zima, Herbert, 3,896,072.
Zimmer, Horst: *See*—
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Zimmermann, Ernest H., Jr., to Brunswick Corporation. Sliver guide. 3,895,417, Cl. 19-288.000.
Zimnyakov, Alexandr Vasilievich: *See*—
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Zink, Henry R. Photo lock system. 3,896,345, Cl. 317-134.000.
Zinser Textilmaschinen GmbH: *See*—
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Zitzow, Harold P. Omega navigation receiver station pair selection and lop display system. 3,896,443, Cl. 343-105.00R.
Znamirowski, Henry; and Fielder, William Vanburen, Jr., to Roper Corporation. Master slide for drapery. 3,895,410, Cl. 16-93.00D.
Zonov, Nikolai Semenovich: *See*—
Feoktistov, Evgeny Ilich; Chechulin, Evgeny Arkadievich; Zonov, Nikolai Semenovich; Prozorov, Leonid Kronidovich; Poskryakov, Jury Maximovich; Kremennoi, Grigory Grigorievich; and Goryachy, Vladimir Mikhailovich, 3,896,281.
Zuccolotto, Hector M. Filtering and debris removing apparatus for cleaning a sea water stream. 3,896,005, Cl. 202-185.000.

# LIST OF REISSUE PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 22ND DAY OF JULY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Celfil Company Establishmant: *See*—
Muller, Paul Adolf, Re. 28,487.

Chen, Muchuan M.; and Kotheimer, William C., to General Electric Company. Network reclosing relay. Re. 28,490, Cl. 317-23.000.

Farr, Stewart M., to Microlife Technics, Inc. Milk fermenting product. Re. 28,488, Cl. 195-59.000.

General Electric Company: *See*—
Chen, Muchuan M.; and Kotheimer, William C., Re. 28,490.

Hesse, Ruth L.: *See*—
Ruben, Henning M., Re. 28,486.

Kotheimer, William C.: *See*—
Chen, Muchuan M.; and Kotheimer, William C., Re. 28,490.

McEachron, John C.: *See*—
Schindler, Edgar C.; and McEachron, John C., Re. 28,489.

Microlife Technics, Inc.: *See*—
Farr, Stewart M., Re. 28,488.

Muller, Paul Adolf, to Celfil Company Establishmant. Crimped flat material for filter plugs. Re. 28,487, Cl. 131-261.00B.

Nelco Corporation: *See*—
Schindler, Edgar C.; and McEachron, John C., Re. 28,489.

Ruben, Henning M., to Hesse, Ruth L.; and Test-Laboratoruim A/S. Apparatus for artificial respiration or narcosis. Re. 28,486, Cl. 128-145.700.

Schindler, Edgar C.; and McEachron, John C., to Nelco Corporation. Molded electrical junction box. Re. 28,489, Cl. 174-58.000.

Test-Laboratoruim A/S: *See*—
Ruben, Henning M., Re. 28,486.

# LIST OF PLANT PATENTEES

Yonemoto, Takeshi Y. Carnation plant. 3,745, 7–22–75, Cl. 70.
Yonemoto, Takeshi Y. Carnation plant. 3,746, 7–22–75, Cl. 70.
Yonemoto, Takeshi Y. Carnation plant. 3,747, 7–22–75, Cl. 70.

# LIST OF DESIGN PATENTEES

AB Bygg-Och Transportekonomi (BT): *See*—
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Abba House, Inc.: *See*—
Scott, Robert K. 236,019.

Aimo, Karl H., and P. G. Baker, to Polaroid Corp. Photographic lens shade or similar article. 236,031, 7–22–75, Cl. D61—1.

Akesson, Stellan S., and K. E. Pruner, to Aktiebolaget Svenska Flaktfabriken Sickla Alle. Flow regular. 236,001, 7–22–75, Cl. D23—151.

Aktiebolaget Optimus Fork Upplands Vasby: *See*—
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Aktiebolaget Svenska Flaktfabriken: *See*—
Porle, Kjell, and Maartmann. 236,002.

Aktiebolaget Svenska Flaktfabriken Sickla Alle: *See*—
Akesson, Stellan S., and Pruner. 236,001.

Allander, Claes V., to Aktiebolaget Optimus Fork Upplands Vasby. Portable stove. 235,959, 7–22–75, Cl. D7—107.

Amann, Herbert R.: *See*—
Roche, Dwain F. 236,011.

Arruda, Antone. Design for a twin keel boat. 235,985, 7–22–75, Cl. D12—62.

Austin, Glenn M.: *See*—
Seiferth, Oscar E., Austin, and Paul. 235,974.

Baker, Philip G.: *See*—
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Ball, Douglas C., to Massey-Ferguson Industries Ltd. Desk or similar article. 235,952, 7–22–75, Cl. D6—162.

Balls 'N' All, Inc.: *See*—
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Baumann, Frederick, to General Electric Co. Dynamoelectric machine. 236,005, 7–22–75, Cl. D26—5.

Beatrice Foods Co.: *See*—
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Berkline Corp., The: *See*—
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Boyce, Peter E. Stilt. 236,016, 7–22–75, Cl. D34—14.

Buern, Gordon L., and D. S. Griffin, to Electrohome Ltd. Seat. 235,946, 7–22–75, Cl. D6—47.

CBS Inc.: *See*—
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C & D Valve Mfg. Co.: *See*—
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Carroll, James C. Loudspeaker cabinet. 236,010, 7–22–75, Cl. D26—14.

Caterpillar Tractor Co.: *See*—
Crovatto, Dino, and Etienne. 235,984.

Clencewicki, Evelyn, to Personal Products Co. Tampon inserter. 236,035, 7–22–75, Cl. R83—12.

Conroy, Robert E., to Servotronics, Inc. Earpiece for a protective helmet. 235,939, 7–22–75, Cl. D2—233.

Covey, Iair F.: *See*—
Hildenbrandt, William J., and Covey. 235,967.

Crawford. Beverley, and G. Jenkins. Animal feeder. 236,012, 7–22–75, Cl. D30—13.

Crovatto, Dino, and G. F. Etienne, to Caterpillar Tractor Co. Vehicle carrier. 235,984, 7–22–75, Cl. D12—57.

Davis, Myron F., Jr., and J. F. Talerico. Remote data acquistion and control station. 236,007, 7–22–75, Cl. D26.

Day, Edwin A. Mirror or similar article. 235,958, 7–22–75, Cl. D6—235.

Del Castillo, Juan M. Cantilevered desk and multiple shelf combination. 235,951, 7–22–75, Cl. D6—128.

Do All Co.: *See*—
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Dornik, Albin M. Combined walker and shopping cart. 235,983, 7–22–75, Cl. D12—26.

Dryden, Gale E. Respiratory mask. 236,033, 7–22–75, Cl. D83—1.

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Mancuso, Dale E. 236,039.

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McCracken, Lyde S. 236,026.

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Etienne, Georges F.: *See*—
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Froidh, Torr A., H. E. Walden, and L. U. Widlund, to Molnlycke AB. Baby's elastic pants. 235,937, 7–22–75, Cl. D2—10.

Gandini, Sergio. Lighting fixture. 236,021, 7–22–75, Cl. D48—20.

Garvey, William J. Support for tennis racket and related articles. 235,949, 7–22–75, Cl. D6—85.

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tube inserter. 236,034, 7–22–75, Cl. D83—12.
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Golden. Gerald, to Beatrice Foods Co. Reflector. 235,978, 7–22–75, Cl. D10—111.
Golden, Gerald. Reflector. 235,979, 7–22–75, Cl. D10—111.
Golden, Gerald, to Beatrice Foods Co. Reflector. 235,980, 7–22–75, Cl. D10—111.
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Goldman, Marvin A., and J. Goldman, to Penn-Plax Plastics, Inc. Aquarium air pump. 236,032, 7–22–75, Cl. D65—1.
Greco, Vincent. Latch for rolling metal gates. 235,970, 7–22–75, Cl. D8—127.
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Mills, Thomas C., and Gresens. 235,957.
Gretz, Edward J., to Owens-Illinois, Inc. Bottle. 235,972, 7–22–75, Cl. D9—129.
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Grinnell, Paul H., and C. D. Vajdich. Ice and snow scraper. 235,965, 7–22–75, Cl. D7—184.
Harrell, Hosey M., and C. H. Ownby. Jet-N-Soak. 235,999, 7–22–75, Cl. D23—34.
Harris, Robert K., to Ringley and Crockett, Inc. Artificial fishing lure. 235,995, 7–22–75, Cl. D22—27.
Hattori, Yasuo, to Olympus Optical Co., Ltd. Magnetic tape recorder. 236,009, 7–22–75, Cl. D26—14.
Hildebrandt, William J., and L. F. Covey, to The Stanley Works. Saw guide. 235,967, 7–22–75, Cl. D8—171.
Holland, Gustave T., to Learning Consultants Ltd. Study carrel. 235,954, 7–22–75, Cl. D6—181.
Hope Kabushiki Kaisha: *See*—
Iizuka, Michio. 236,014.
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Jenkins, Genelle: *See*—
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Keene, Patrick V., to Do All Co. Tape preparation system. 236,004, 7–22–75, Cl. D26—5.
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Land, Edwin H., and J. B. Morse, to Polaroid Corp. Photographic accesory holder or similar article. 236,029, 7–22–75, Cl. D61—1.
Larvego, Paul M. Wrist watch. 235,976, 7–22–75, Cl. D10—39.
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Mancuso, Dale E., to E. I. du Pont de Nemours, and Co. Nonwoven lace fabric. 236,038, 7–22–75, Cl. D92—1.
Mancuso, Dale E., to E. I. du Pont de Nemours, and Co. Nonwoven lace fabric. 236,039, 7–22–75, Cl. D92—1.
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Mein, Edward G. Nail driving device. 235,968, 7–22–75, Cl. D8—75.
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Murata, Masahiro, to Hope Kabushiki Kaisha. Heel unit of a ski safety binding. 236,015, 7–22–75, Cl. D34—14.
Nakata, Toshihiro, to Platinum Fountain-Pen Co. Ltd. Pocket clip for writing instrument. 235,991, 7–22–75, Cl. D19—56.
Nakata, Toshihiro, to Platinum Fountain-Pen Co. Ltd. Pocket clip for writing instrument. 235,992, 7–22–75, Cl. D19—56.
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# CLASSIFICATION OF PATENTS

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304 3,896,307
305 3,896,308
315 3,896,310
342 3,896,311
343 3,896,312
372 3,896,313
392 3,896,306
442 3,896,314
CLASS 251
148 3,895,776
203 3,895,777
CLASS 252
8.5C 3,896,031
8.6 3,896,032
8.75 3,896,035
8.8 3,896,033
3,896,034
12 3,896,036
33.4 3,896,037
47.5 3,896,050
51.5A 3,896,038
88 3,896,039
89 3,896,040
184 3,896,042
186 3,896,043
192 3,896,044
301.1W 3,896,045
301.2R 3,896,138
310 3,896,046
412 3,896,051
414 3,896,047
431C 3,896,052
455R 3,896,048
466J 3,896,049
3,896,053
521 3,896,055
539 3,896,056
555 3,896,057
CLASS 254
1 3,895,778
150FH 3,895,779
172 3,895,780
CLASS 259
25 3,895,781
CLASS 260
2P 3,896,058
2.3 3,896,059
2.5AH 3,896,062
2.5M 3,896,061
2.5N 3,896,060
23XA 3,896,063
24 3,896,064
28.5AV 3,896,065
3,896,066
3,896,067
3,896,069
28.5B 3,896,068
29.4UA 3,896,070
29.6RW 3,896,073
29.6TA 3,896,072
29.6F 3,896,071
29.6R 3,896,136
33.6R 3,895,826
38 3,896,075
40R 3,896,076
42.48 3,896,077
45.9NC 3,896,078
46.5G 3,896,079
47CP 3,896,083
47EN 3,896,080
3,896,082
47R 3,896,081
63R 3,896,084
67UA 3,896,085
3,896,086
69R 3,896,087
70R 3,896,088
77.5TB 3,896,089
77.5D 3,896,090
78.3R 3,896,303
78.4D 3,896,091
80.3N 3,896,092
80.78 3,896,093
3,896,094
3,896,095
80.81 3,896,096
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231A 3,896,106
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3,896,117
243C 3,896,118
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247.2A 3,896,119
247.5G 3,896,122
248AS 3,896,124
248CS 3,896,123
249.5 3,896,120
3,896,125
250Q 3,896,126
256 3,896,127
256.4F 3,896,128
256.5 3,896,129
286Q 3,896,130
287R 3,896,131
289R 3,896,132
293.62 3,896,133
295.5C 3,896,134
296H 3,896,135
297T 3,896,137
302R 3,896,139
307FA 3,896,141
307H 3,896,140
309.2 3,896,142
310D 3,896,143
310R 3,896,144
315 3,896,145
326C 3,896,146
3,896,147
326.25 3,896,149
326.5FL 3,896,148
340.7 3,896,150
346.2R 3,896,151
349 3,896,152
396R 3,896,153
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465E 3,896,155
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469 3,896,157
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551R 3,896,168
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563R 3,896,171
578 3,896,172
583P 3,896,173
3,896,174
609R 3,896,175
610R 3,896,176
614F 3,896,177
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616 3,896,179
617M 3,896,180
655 3,896,181
656R 3,896,182
660 3,896,183
669QZ 3,896,184
872 3,896,098
873 3,896,185
927R 3,896,186
928 3,896,187
940 3,896,188
944 3,896,189
945 3,896,190
964 3,896,191
982 3,896,192
987 3,896,193
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89 3,896,200
118 3,896,201
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206 3,896,204
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258 3,896,206
322 3,896,207
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24 3,895,782
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3 3,895,787
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102R 3,895,803
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135F 3,895,805
136E 3,895,806
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138R 3,895,808
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88 3,895,813
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11.35K 3,895,817
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160 3,896,407
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211 3,896,408
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48 3,896,284
3,896,410
CLASS 339
15 3,895,850
95R 3,895,851
99R 3,895,852
272R 3,895,853

**CLASS 340**

| | |
|---|---|
| 3R | 3,896,411 |
| 15.5BH | 3,896,412 |
| | 3,896,413 |
| 31R | 3,896,414 |
| 67 | 3,896,415 |
| 146.1AL | 3,896,416 |
| 172.5 | 3,896,417 |
| | 3,896,418 |
| | 3,896,419 |
| 173CC | 3,896,420 |
| 174TF | 3,896,421 |
| 227R | 3,896,422 |
| 229 | 3,896,423 |
| 244R | 3,896,424 |
| 258B | 3,896,425 |
| 261 | 3,896,426 |
| 274R | 3,896,427 |
| 324AD | 3,896,428 |
| 336 | 3,896,429 |
| | 3,896,430 |
| 347NT | 3,896,431 |

**CLASS 343**

| | |
|---|---|
| 5LS | 3,896,432 |
| 5SA | 3,896,434 |
| 5R | 3,896,433 |
| 9 | 3,896,435 |
| 16M | 3,896,436 |
| 17.7 | 3,896,437 |
| 18D | 3,896,440 |
| 18E | 3,896,438 |
| | 3,896,439 |
| | 3,896,441 |
| | 3,896,442 |
| 105R | 3,896,443 |
| 106D | 3,896,444 |
| 117 | 3,896,445 |
| 705 | 3,896,446 |
| 709 | 3,896,447 |
| 713 | 3,896,448 |
| 786 | 3,896,449 |
| 797 | 3,896,450 |

**CLASS 346**

| | |
|---|---|
| 74ES | 3,896,451 |
| 74P | 3,896,452 |
| 139C | 3,896,453 |

**CLASS 350**

| | |
|---|---|
| 20 | 3,895,854 |
| 99 | 3,895,855 |
| 104 | 3,895,856 |
| 227 | 3,895,857 |
| 255 | 3,895,858 |
| 276R | 3,895,859 |

**CLASS 351**

| | |
|---|---|
| 39 | 3,895,860 |

**CLASS 352**

| | |
|---|---|
| 69 | 3,895,861 |
| 130 | 3,895,862 |
| 176 | 3,895,863 |

**CLASS 353**

| | |
|---|---|
| 25 | 3,895,864 |
| 26 | 3,895,865 |
| 30 | 3,895,866 |

**CLASS 354**

| | |
|---|---|
| 15 | 3,896,454 |
| 24 | 3,896,455 |
| | 3,896,456 |
| 25 | 3,896,457 |
| 29 | 3,896,472 |
| 30 | 3,896,458 |
| 31 | 3,896,459 |
| 38 | 3,896,460 |
| 44 | 3,896,461 |
| 46 | 3,896,462 |
| 122 | 3,896,463 |
| 161 | 3,896,464 |
| 174 | 3,896,465 |
| 196 | 3,896,466 |
| 204 | 3,896,467 |
| 299 | 3,896,468 |
| 304 | 3,896,469 |
| 317 | 3,896,470 |
| 324 | 3,896,471 |

**CLASS 355**

| | |
|---|---|
| 77 | 3,895,867 |

**CLASS 356**

| | |
|---|---|
| 1 | 3,895,870 |
| 4 | 3,895,871 |
| 28 | 3,895,872 |
| 85 | 3,895,873 |
| 93 | 3,895,874 |
| 226 | 3,895,875 |
| | 3,895,876 |

**CLASS 357**

| | |
|---|---|
| 15 | 3,896,473 |
| 23 | 3,896,482 |
| | 3,896,483 |
| 24 | 3,896,474 |
| | 3,896,484 |
| | 3,896,485 |
| 35 | 3,896,475 |
| 38 | 3,896,476 |
| 39 | 3,896,477 |
| 56 | 3,896,478 |
| 67 | 3,896,486 |
| 71 | 3,896,479 |
| 80 | 3,896,480 |
| 81 | 3,896,481 |

**CLASS 358**

| | |
|---|---|
| 3 | 3,896,487 |

**CLASS 360**

| | |
|---|---|
| 6 | 3,896,488 |
| 14 | 3,896,489 |
| 69 | 3,896,490 |
| 86 | 3,896,491 |
| 93 | 3,896,492 |
| 96 | 3,896,493 |
| 103 | 3,896,494 |
| | 3,896,495 |

**CLASS 401**

| | |
|---|---|
| 129 | 3,895,877 |

**CLASS 403**

| | |
|---|---|
| 344 | 3,895,878 |
| 369 | 3,895,879 |

**CLASS 404**

| | |
|---|---|
| 86 | 3,895,880 |

**CLASS 408**

| | |
|---|---|
| 156 | 3,895,881 |

**CLASS 415**

| | |
|---|---|
| 2 | 3,895,882 |

**CLASS 416**

| | |
|---|---|
| 61 | 3,895,883 |
| 153 | 3,895,884 |

**CLASS 417**

| | |
|---|---|
| 54 | 3,895,885 |
| 284 | 3,895,886 |
| 408 | 3,895,887 |

**CLASS 418**

| | |
|---|---|
| 61B | 3,895,888 |
| 83 | 3,895,889 |
| 132 | 3,895,890 |
| 133 | 3,895,891 |
| 142 | 3,895,892 |
| 153 | 3,895,893 |

**CLASS 423**

| | |
|---|---|
| 27 | 3,896,208 |
| 55 | 3,896,209 |
| 56 | 3,896,210 |
| 138 | 3,896,211 |
| 223 | 3,896,212 |
| 232 | 3,896,213 |
| 242 | 3,896,214 |
| 573 | 3,896,215 |
| 598 | 3,896,216 |

**CLASS 424**

| | |
|---|---|
| 1 | 3,896,217 |
| | 3,896,218 |
| 225 | 3,896,219 |
| 226 | 3,896,220 |
| 246 | 3,896,221 |
| 248 | 3,896,222 |
| | 3,896,223 |
| | 3,896,233 |
| 249 | 3,896,224 |
| 251 | 3,896,225 |
| 260 | 3,896,226 |
| 263 | 3,896,227 |
| 266 | 3,896,228 |
| 270 | 3,896,229 |
| 273 | 3,896,230 |
| 279 | 3,896,234 |
| 304 | 3,896,231 |
| 324 | 3,896,235 |
| 326 | 3,896,232 |
| 329 | 3,896,236 |
| 330 | 3,896,237 |
| 358 | 3,896,238 |

**CLASS 425**

| | |
|---|---|
| 77 | 3,895,894 |
| 78 | 3,895,895 |
| 93 | 3,895,896 |
| 182 | 3,895,897 |
| 325 | 3,895,898 |
| 378R | 3,895,899 |
| 466 | 3,895,900 |

**CLASS 426**

| | |
|---|---|
| 119 | 3,896,239 |
| 271 | 3,896,240 |
| | 3,896,241 |
| 314 | 3,896,242 |
| 482 | 3,896,243 |

**CLASS 427**

| | |
|---|---|
| 34 | 3,896,244 |
| 306 | 3,896,252 |

**CLASS 428**

| | |
|---|---|
| 7 | 3,896,245 |
| 41 | 3,896,246 |
| 65 | 3,896,247 |
| 172 | 3,896,248 |
| 202 | 3,896,249 |
| 272 | 3,896,250 |
| 290 | 3,896,251 |
| 382 | 3,896,253 |
| 411 | 3,896,254 |
| | 3,896,255 |
| 457 | 3,896,256 |

**CLASS 431**

| | |
|---|---|
| 77 | 3,895,901 |
| 93 | 3,895,902 |
| 143 | 3,895,903 |
| | 3,895,904 |
| 254 | 3,895,905 |

**CLASS 432**

| | |
|---|---|
| 22 | 3,895,906 |

## CLASSIFICATION OF DESIGNS

| | | |
|---|---|---|
| D2— | 10 | 235,937 |
| | 231 | 235,938 |
| | 233 | 235,939 |
| | 249 | 235,940 |
| | | 235,941 |
| D4— | 3 | 235,942 |
| D6— | 37 | 235,943 |
| | | 235,944 |
| | 45 | 235,945 |
| | 47 | 235,946 |
| | 69 | 235,947 |
| | 85 | 235,948 |
| | | 235,949 |
| | 86 | 235,950 |
| | 128 | 235,951 |
| | 162 | 235,952 |
| | 177 | 235,953 |
| | 181 | 235,954 |
| | 191 | 235,955 |
| | | 235,956 |
| | 198 | 235,957 |
| | 235 | 235,958 |
| D7— | 107 | 235,959 |
| | 131 | 235,960 |
| | 132 | 235,961 |
| | 137 | 235,962 |
| | | 235,963 |
| | 147 | 235,964 |
| | 184 | 235,965 |
| D8— | 51 | 235,966 |
| | 71 | 235,967 |
| | 75 | 235,968 |
| | 99 | 235,969 |
| | 127 | 235,970 |
| D9— | 48 | 235,971 |
| | 129 | 235,972 |
| | 171 | 235,973 |
| | 294 | 235,974 |
| D10— | 15 | 235,975 |
| | 39 | 235,976 |
| | 111 | 235,977 |
| | | 235,978 |
| | | 235,979 |
| | | 235,980 |
| | | 235,981 |
| D12— | 11 | 235,982 |
| | 26 | 235,983 |
| | 57 | 235,984 |
| | 62 | 235,985 |
| | 168 | 235,986 |
| | 174 | 235,987 |
| | 211 | 235,988 |
| D13— | 7R | 235,989 |
| D19— | 45 | 235,990 |
| | 56 | 235,991 |
| | | 235,992 |
| | 76 | 235,993 |
| | 92 | 235,994 |
| D22— | 27 | 235,995 |
| D23— | 18 | 235,996 |
| | 34 | 235,999 |
| | 35 | 235,997 |
| | 43 | 235,998 |
| | 48 | 236,000 |
| | 151 | 236,001 |
| D26— | 1L | 236,002 |
| | 5A | 236,005 |
| | C | 236,003 |
| | | 236,004 |
| | | 236,006 |
| | | 236,007 |
| | 14A | 236,008 |
| | B | 236,009 |
| | G | 236,010 |
| D30— | 1 | 236,011 |
| | 13 | 236,012 |
| D34— | 5GP | 236,013 |
| | 14D | 236,014 |
| | | 236,015 |
| | E | 236,016 |
| | 15AJ | 236,017 |
| D35— | 3A | 236,018 |
| D45— | 16B | 236,019 |
| D46— | 1R | 236,020 |
| D48— | 20 | 236,021 |
| | 23 | 236,022 |
| | 24 | 236,023 |
| | 31 | 236,024 |
| D52— | 2A | 236,025 |
| D54— | 1R | 236,026 |
| D56— | 9 | 236,027 |
| D57— | 1E | 236,028 |
| D61— | | 236,029 |
| | | 236,031 |
| | Q | 236,030 |
| | R | 236,032 |
| D63— | K | 236,033 |
| | 12A | 236,035 |
| | R | 236,034 |
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| | F | 236,036 |
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| | | 236,039 |
| D96— | 12R | 236,040 |

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## DESIGN PATENTS

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## PLANT PATENTS

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